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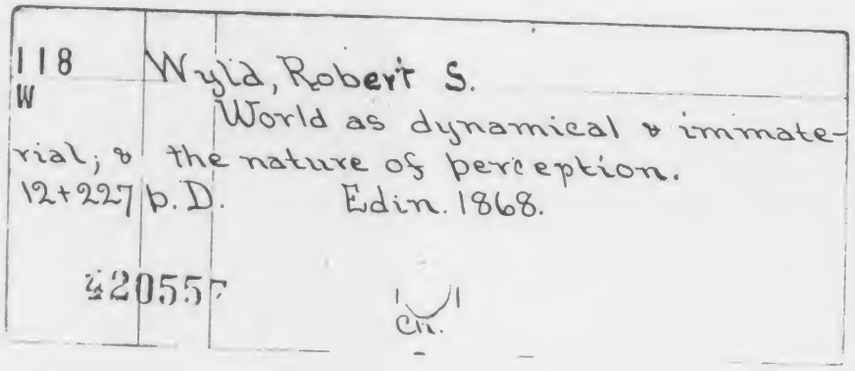

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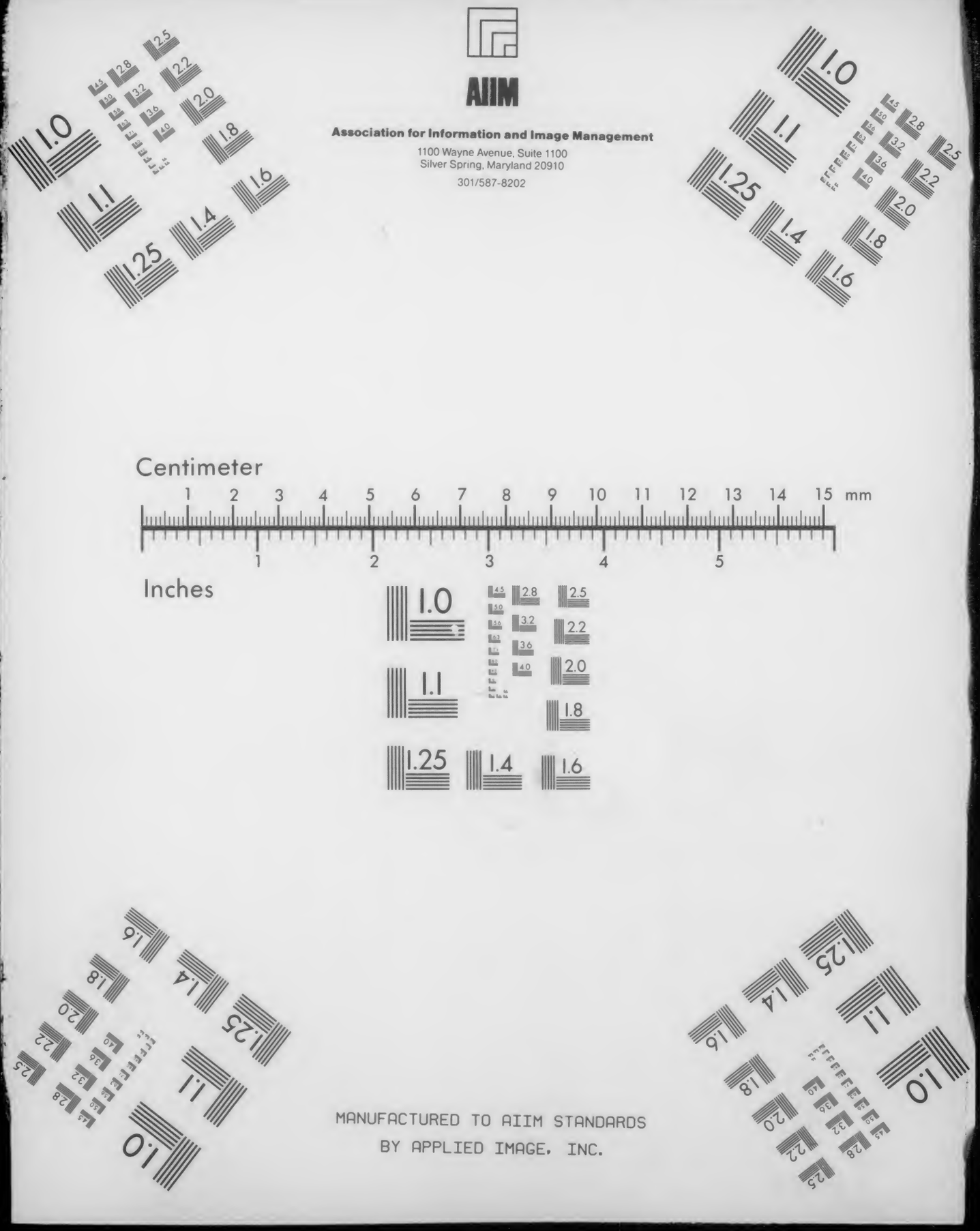
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THE WORLD

AS

DYNAMICAL AND IMMATERIAL;

AND,

THE NATURE OF PERCEPTION.

BY

R. S. WYLD, F.R.S.E.

EDINBURGH:
OLIVER AND BOYD, TWEEDDALE COURT.
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TO

ALEXANDER CAMPBELL FRASER, M.A.,

PROFESSOR OF LOGIC AND METAPHYSICS,

EDINBURGH UNIVERSITY.

My dear Sir,

Some time ago you suggested that I should present my views on the Perception of Power to the public. This I now do. They are chiefly contained in Chapters VII., VIII., and IX. of this little volume, which I have the pleasure of dedicating to you.

I know no one who is a more earnest and successful teacher of Philosophy; and I know no one more tolerant of the efforts of others, even though they should tend to promote views differing materially from those which you yourself incline to espouse.

I am,

My dear Sir,

Yours sincerely,

ROBERT S. WYLD.

19 Inverleith Row, Edinburgh,
January 1868.

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PREFACE.

THAT the world is governed by Physical Laws, no one can dispute; but whether or not the world, and all the objects contained in it, have a Material nature—whether there be such a thing as Matter, is a question confessedly open for philosophical discussion.

The question has very important bearings in relation to Natural Science, to Philosophy, and to Theology. It ought, therefore, to possess interest for those who inquire into subjects which go beyond the limits of ordinary every-day thought.

The acquiring an intelligent apprehension of subjects such as are discussed in this volume,—even irrespective of the conclusions to which the

reader may be brought,—will, it is hoped, not be labour lost. The tendency of all such studies is to elevate the mind, and to enlarge its range.

There are three points to which we would specially direct attention, as being important in themselves, and capable of a novel application in connexion with the subject of which this volume treats.

First, The peculiar views regarding the physical constitution of the world.

Second, The bearing which the Experiments of Hirsch, Bezold, Schelske, and others, on *the rate of transmission of volition and sensation* has on the subject of perception.

Third, The application made of the New Theory of Force, as investigated by Faraday, Joule, Mayer, Helmholtz, Thomson, Carpenter, and others. The author believes that these investigations have elicited views in the highest degree important, not only to Natural Science, but to Mental Philosophy. He has, accordingly, freely explained his opinions with reference to this subject.

Every theory of Perception has hitherto been unsatisfactory and incomplete, and that of one of our most eminent Philosophers in recent times, has signally broken down. Philosophy thus stands, as it were, discomfited; and, as a natural consequence, metaphysics fall into disrepute. A childish Idealism—as it appears to us—and a very objectionable form of Materialism have the field left open to them, and they have not failed to avail themselves of their opportunity. This is not to be wondered at, after the failure of every nobler attempt at a theory of the world.

As, after a hot and unsuccessful assault the combatants are driven back, and have nothing before their eyes but the cold hard stones of the battlements they could not scale—so it appears to be with us Realists at this moment.

Rising among the ruins of overthrown philosophies, and, with an exultant air, claiming to be the only rightful expositor of Truth, we behold Positivism, or the Philosophy of Fact. This French philosophy has already proceeded some

length in the erection of its huge and gaunt temple—if temple that can be called, within whose walls are to be stored as our only philosophy nothing but the bare records of the Past, the Present, and the Future,—within whose walls no ray of heaven's light is to enter, nor any instincts of the human soul are to whisper,—from whose precincts, Religion—God—the unseen in every form are to be carefully excluded,—and in their stead, the fact only that a belief in such things once existed is to be registered, in order to preserve from oblivion this past phase in man's moral history.

Strange to say, the extremes of Materialism and of Idealism have, in some instances, joined hands in this hopeful work. To us the religion of Paganism is a thousand times fresher and nobler than the aspect of this newest philosophy of the latter half of our century.

The author finds refuge from these gloomy overshadowings in the more sure Word of Inspired Wisdom, and in the principles of his own philos-

ophy, which stand in natural harmony with it. He believes that these views are solid and consistent, and will stand the brunt of criticism. Under this conviction he offers them to the public, which is the ultimate tribunal in all questions, whether philosophical, speculative, or practical.

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PART I.

THE WORLD AS DYNAMICAL AND IMMATERIAL.

CHAPTER I.

IDEALISM AND MATERIALISM—OBJECTIONS TO EACH.

THE insufficiency of the senses for the discovery of Truth, it is well known, was a favourite topic of discussion among the Greek Philosophers. It has continued to be a principal subject of discussion from their remote times down to the days in which we live. The question, therefore, What is the nature of man's knowledge of the external world? must needs involve more difficulties than practical men, who take the world as it appears to them, are disposed to think. It is, in fact, one of the greatest and most interesting questions of philosophy.

Is our knowledge of the world real, as the senses would lead us to think, or is it merely relative? Or is our knowledge of the world entirely unreal, imaginary, ideal? Such are the questions still agitated, not by visionaries, but by men of the ablest minds at home and abroad; by all, indeed, who take an interest in the discovery of absolute truth, and who allow themselves to meditate or to speculate upon the deep enigma of existence—the existence of a seemingly inanimate substance—yet possessed of active properties, and the existence of consciousness and intelligence—attributes implying a spiritual nature—yet held in connexion with a thing insensible, unconscious, and of an essence seemingly entirely different.

A duality of being such as this is so mysterious that we need not wonder at the very different conclusions to which men of independent minds have come when considering it.

Some, regarding their own consciousness as the only thing certain, have rejected as a figment the existence of an external world. Others, more objective in their tendencies, have believed only in what was seen and felt, and have refused to believe

in mind as an entity separate from matter and organization.

It will be sufficient for our purpose, that we merely, in a very cursory and prefatory manner, allude to some of the well-known views of eminent men of recent and modern times.

Kant, one of the most profound of modern metaphysicians, we need scarcely remind the reader, devotes the first portion of his celebrated "Critique of Pure Reason"[1] to prove that neither time nor space have any real existence, but are mere *forms of thought* determined by the constitution of the human mind. We may easily imagine how this belief, and the principle on which it is founded, must mould and colour the whole tenor of his philosophy. He owns, indeed, to a belief that the perceptive faculty is, in some way or other, called into exercise by the objects of the external world; but what these outward objects in themselves are, he denies that we can form even the most remote conception. He holds that space (or extension) neither represents any property of objects, as things in themselves, nor represents them in their relations to each other.

[1] Published in 1781.

Fichte went a step further, and denied that there was an external world. He held that the varying phenomena we seem to observe, were purely ideal images, due to the law of the mind's activity. That the mind, in fact, generated all the impressions we have of an external world.

Bishop Berkeley, who died at Oxford in 1753, was one of the most acute and ingenious writers of whom our country can boast. He was, moreover, an eminently pious, benevolent, and earnest man; and his scientific writings have increased sensibly the sum of human knowledge. Some of his most cherished views have, however, earned for him, with the unlearned majority of mankind, the reputation of being in the highest degree eccentric, extravagant, and unintelligible. He denied the external existence of the physical universe.[1] He

[1] "Some truths there are so near and obvious to the mind, that a man need only open his eyes to see them. Such I take this important one to be, to wit, that all the choir of heaven, and furniture of the earth—in a word, all those bodies which compose the mighty frame of the world—have not any subsistence without a mind, that their *being* (*esse*) is to be perceived, or known; that, consequently, so long as they are not actually perceived by me, or do not exist in my mind or that of any other *created spirit*, they must either have no existence at all, *or else subsist in the mind of some eternal spirit*."—"The Principles of Human Knowledge," section vi.

believed only in mind: in his own mind, and, we must infer, in the minds of other men also, though this point is not very prominently stated in his philosophy; nor are we informed how these fellow-souls communicate with one another. Eminently and most clearly, however, he believed in the Supreme mind. His theory of perception—his theory of the world, was this—that the Deity communicated directly to the human mind those impressions which we falsely imagine to flow from the perception of external nature. Perception was thus, as it were, a divine discoursing of Deity with his creatures.[1]

[1] "Take here, in brief, my meaning. It is evident that the things I perceive are my own ideas, and that no idea can exist unless it be in a mind; nor is it less plain that these ideas or things by me perceived, either themselves or their archetypes, exist independently of my mind, since I know myself not to be their author, it being out of my power to determine at pleasure what particular idea I shall be affected with upon opening my eyes or ears. They must, therefore, exist in some other mind, whose will it is they should be exhibited to me. The things, I say, immediately perceived are ideas or sensations, call them which you will. But how can any idea or sensation exist in, or be produced by, anything but a mind or spirit? From all which, *I conclude, there is a mind which affects me every moment with all the sensible impressions I perceive;* and from the variety, order, and manner of these, I conclude the author of them to be *wise, powerful, and good beyond comprehension.*

This form of Idealism, though supported by very ingenious arguments, and by very close reasoning, and recommended by an enthusiasm and an eloquence which have been surpassed by no English metaphysical writer, does not appear to have obtained from the men of that day any very distinguished or extensive support. It must appear strange, therefore, that in the eminently practical times in which we live, Bishop Berkeley's views, or others almost equally idealistic, should be found decidedly on the ascendant; and that they should even be threatening to supersede the boasted school of Scottish Realism, dignified by the names of Reid, Stewart, Brown, and Hamilton.

The late Professor of Moral Philosophy in the University of St Andrews, in his "Institutes of Metaphysics, or the Theory of Knowing and Being," endeavours to prove matter entirely unknowable by any intelligence, human or angelic. "It cannot be known," says he, "by any intelli-

Mark it well: I do not say I see things by perceiving that which represents them in the intelligible substance of God. This I do not understand; but I say the things by me perceived are known by the understanding, *and produced* by the will, of an infinite spirit."—"Hylas and Philonous," Second Dialogue.

gence, actual or possible. In that case it undoubtedly becomes the contradictory, for what is a contradiction but that which cannot be known or conceived on any terms by any possible intelligence."

Lewes, in his, in many respects useful work,[1] "The History of Philosophy" (1867), founding on the admitted fact, that the mind is conscious of its own states, concludes from that fact, that it can know nothing beyond this sphere, and therefore can know nothing truly of external nature. "The world *per se*," says he, "is in all likelihood something utterly different from the world as we know it; for all we know of it is derived through our consciousness of what its effects are on us; and our consciousness is obviously only a state of ourselves, not a copy of external things" (vol. i., p. 371).

And again, says this writer, "as I cannot transcend the sphere of my consciousness, I can never know things except as they act upon me—as they

[1] We cannot but observe with regret the enthusiastic adherence expressed in this edition (1867) to the philosophy of Comte; a philosophy which, notwithstanding the amount of truth which its principles contain, has hitherto been closely allied with Materialism and many other dangerous errors.

affect my consciousness. In other words, a knowledge of an external world otherwise than as it appears to my sense, which transforms *and distorts* it, is impossible" (vol. ii., p. 382).

These are surely unjustifiable and gratuitous assumptions against the veracity of the senses, and we would wish to know what ground Kant, Berkeley, Ferrier, and this last author have for assuming that the physical system of the world, the parts of which are so consistent, so ingenious, so beautiful, is either unreal, or distorted by the senses. Do such writers not put themselves wilfully into a position of ignorance? Our sensations indeed, we admit, do not correspond with anything external—how could they? How can a mental state be identical with the condition of an insensible physical object? But though this is the case, our sensations having been given us as our means of knowledge, they are surely entitled to be held as sufficient guides, until we can point out any distinct and specific proof of their being delusive. A vague, indefinite, and sweeping charge against human knowledge, such as some of these writers make, we utterly reject. It appears to us at

once presumptuous and unphilosophical; and, so far as has yet been shown, it has neither proof nor probability in its favour; and, certainly, it is far from being either satisfying or instructive, to such as are seeking after truth, to assume that the senses transform and distort the objects perceived, so as to prevent reason pronouncing any judgment regarding them.

Our sensations, it is said, do not correspond with the external objects. We admit the fact; but does not our perception of this fact afford us a proof that the mind has a judging and discriminating faculty, seeing it can distinguish between the bodily sensations, and the external causes producing them? Our sensations come to us, as impressions on, or affections of, our extended physical frame, produced by extended external physical causes, and a perception of this kind, we maintain, affords us grounds to form a theory of the external world, at once rational, consistent, and philosophical, though it be imperfect, as befits the nature of finite beings under physical conditions and relations.

Few, we think, will be satisfied with an avowal

of total ignorance, such as seems to content some of these authors; and such as view with reluctance and pain the avowal of an absolute negation of knowledge, may join with us in trying to construct for themselves some definite and intelligible form of belief.

Buckle, whom we refer to, as being one of our instructive and popular authors, though on metaphysical subjects, as also on some others, no infallible authority, declares, with reference to Reid's philosophy,—"That notwithstanding the attempts, first of M. Cousin, and afterwards of Sir W. Hamilton, to prop up his declining reputation, his philosophy, as an independent system, is untenable, and will not live" ("Hist. of Civilization in England," vol. ii., chap. 6).

J. S. Mill, in his "Examination of Hamilton," has proclaimed a psychological theory of perception, which, if we rightly understand his meaning, indicates opinions quite as idealistic as those of Fichte.

And, lastly, the able and active-minded successor of Hamilton in the chair of Metaphysics, besides various papers contributed to the leading periodicals of the day, written in a spirit not only tolerant of, but, one would almost think, favourable to Bishop Berkeley's views, is, it is alleged, at the request of the most venerable seat of learning of which our country can boast, preparing a complete edition of that eminent writer's works. All this, it will be admitted, bodes ill for the common-sense realism of Reid and Hamilton. But let us not tremble, for we cannot doubt but by each well-considered effort of each able and honest explorer we shall be brought ever a step—it may be but an insensible one—nearer a rational and satisfying stability of belief.

Certain minds incline, much more powerfully than others, to idealism; but there is a natural tendency in this direction which is experienced nearly by every man who yields himself earnestly to the claims which the study of metaphysics demands. When we enter the world of thought, the region is so vast, and profound, that the world of matter is swallowed up in it. But not only does the mysterious and illimitable nature of the study lead to idealism; other causes conduct silently, but as surely, to the same end. Engaged entirely with the operations

of the mind, and with the examination of the shifting phenomena furnished to consciousness, our ideas become by degrees the chief objects of our observation. They are the *things real to us*, and hence they gradually become our only realities, while the world of sense, as an outward reality, fades out of view. To help this tendency still further, when we turn from this inner world to consider the nature of outer things, here, also, idealism presses itself upon us. Whether it be from a defect in the nature of our faculties, or from a fundamental error in that which we constitute as the object of our examination, we cannot tell; but certain it is, that when the material world is made the subject of metaphysical scrutiny, unless that scrutiny is properly conducted, it very quickly eludes our gaze, and becomes unreal and unsubstantial, even as those spectra which dazzle the eyes on a summer evening as we watch the sun sink behind the distant hills,—the red orb is gone, but various counterfeits remain, which, as we try to fasten the eyes upon them, mock us with their changing colours and flitting postures,—a sadness steals over us at such times, and we turn homeward, feeling as if

the extinguished sun and the extinguished earth were never again to rise, so vivid and so real, as we have known them; and as if the silent air were never again to resound with its living melody.

And so it is, even with things the most common, when, as philosophers, we seek to know their nature. They begin forthwith to undergo positions and transformations the most strange and unexpected; and as we follow them, step by step, they fade either into abstractions, or into self-contradictions, assuming forms which the mind can neither explain to itself, nor translate into words for the edification of others.

Having said so much of Idealism, let us turn from it to the other side, and consider, though briefly, the world of the Materialist.

Now, if on the one hand, in our own day, amidst the din and the disturbing influences of a money-making community, we observe flourishing a small and silent class of thinkers, known and talked of as Idealists, we need not be surprised to find that, in the same country, as the fruit of our ardent pursuit of physical knowledge, an opposite school,

much more powerful numerically, should be establishing itself.

If that is most truly real which a man holds most firmly rooted in his mind, while that is to us as non-existent of which we have no living consciousness, so, on this principle, we may expect to find that men who have devoted themselves exclusively to natural science, should incline to regard as a childish superstition the belief in mind, soul, spirit, or any principle or thing which is not discoverable by the senses. It has been proved that sensation and thought are dependent on, or at least intimately connected with, the flow of nervous energy. What, then, is more natural than to conclude that these mental operations are *a product of the brain?* The reproductive cell is a combination of animal or vegetable principles *plus* the globular form, what is more natural than for a mere microscopist to conclude that the result of this arrangement is life in its rudimentary form? And thus it is that, to their own satisfaction, and to the distress of a numerous class of religious men and women, many of our scientific men conceive they are extending the domain of truth on a basis of materialism, and proving the belief in mind to be a species of belief unsuited for a scientific age.

Now, let us examine for one moment this opinion. If Hume, by his universal scepticism, did some evil, or at least created some alarm, let us not refuse him the meed of gratitude which is certainly due to him for checking the assumptions of empty dogmatism. None of his philosophical writings have been more influential towards this than his essay, justly celebrated, on "Our Idea of Necessary Connexion." In this essay he directs attention to what seems, so far at least as we here state it, to be recognised as an axiom in philosophy, viz., that *we never perceive a cause in any natural phenomenon.* When we are told then, by the man of science, that no other physical links exist between the existence of an organic frame and life, between the flow of cerebral electricity and thought, between the proximity of material bodies and gravity, the axiom of Hume at once comes to our relief, and reminds us that none of these antecedents afford any explanation of the consequents which follow them. The proximity of physical masses does not explain gravitation,—the existence of animal or vegetable

principles in an organic form, in no measure explains the phenomenon of life.[1] The flow of nervous fluid from the brain does not explain thought, — the act of volition does not explain muscular movement, neither does the flow of nervous electricity explain it. Hume was undoubtedly right when he pointed out that *we fail to discover any necessary connexion between any of these antecedents and their respective consequents,—we fail to discover the one to be in any respect the cause of the other.*

The physical investigator may prove that every sensation, nay, every act of reflection, is accompanied by an action of the brain, and an expenditure of the nervous fluid; but he cannot prove that this action of the brain is the cause of thought, or sensation; or that it has any intelligible connexion with them, except the uninstructive and unmeaning one of proximity in time and place. Thought may accompany or may follow an action of the brain and nervous fluid, but where is the proof that the

[1] Even if we could succeed in compounding animal or vegetable principles, and from them evolving life—still, even in this hypothetical and improbable case, we would have no title to be stated as the cause of life. We would be but mere subordinate agents in the hands of a Higher Power, who is the true cause.

one is the cause of the other? A stone falls to the ground—this is a physical fact—but we see no physical cause for it. We cannot say that we discover anything in the earth to produce such a downward motion.

Now, there are some reflections which present themselves in connexion with this strange circumstance of which we have been speaking,—*first*, no man, not even Mr J. S. Mill, can bring himself to believe that any event happens without a cause. When, therefore, we perceive *no physical or visible cause*, and can imagine none, for the stone falling, we have no alternative, but are compelled of necessity to believe in an *invisible*, *immaterial*, or *spiritual cause* of this great law of the physical world.

And so also with reference to the phenomenon of animal or vegetable life, and of thought, and of sensibility, we have no choice, but are compelled to believe in a spiritual cause. If any thinking man can find an escape from this conclusion, we will be glad that he make known his discovery. But, in a philosophical question of this kind, it will not suffice to say that because one event goes before

another, the one is to be regarded as the cause of the other. The proximity in itself gives no explanation. What we ask the Materialist is, that he point out, in physical bodies, the cause of action, and make it apparent to the understanding. The philosopher is not a mere chronicler of facts; reason imperatively demands *a cause* for every interesting event; and because the man of science cannot find one, he is not entitled to present us with what comes first to hand, and to say that the fact of proximity is a sufficient explanation.

What, we ask, is the cause of gravitation, or repulsion, or power, in any form? The physical philosopher, not accustomed to look deeper than the senses, alleges perhaps the action of an ethereal medium; or he may allude to electrical currents pervading all physical bodies, and all their atoms; and, perhaps, he may illustrate his opinion by the instance of a bar of soft iron being converted into a magnet instantly that galvanic currents are caused to flow round it. Such an explanation, if offered, would only show that the nature of the inquiry was not understood,—the inquiry being, not regarding the arrangements of the physical machine, but regarding the *moving power*. Electricity, or an ethereal medium, may be a part of the apparatus, but the presence of either of these would not explain the cause of its existence, nor whence its power is derived, nor in what way it acts.

In the same way as regards thought. It is accompanied by cerebral action; but the important question is—Do we discover any resemblance between electrical vibrations and the phenomena of consciousness, or sensation, or thought, volition, judgment, imagination? Does the one explain the other to the satisfaction of an exact thinker?

If the mind, indeed, is to be in connexion with a physical world, we see very clearly that it must be subjected to the influence of physical laws, and be put in connexion with an organic body amenable to physical influences. The body must in some way afford us a measure of the soul's feelings and powers,—for, were it not so, the mind could have no connexion with the world at all,—the world would, in fact, be to it as nothing,—neither influencing it, nor being acted on by it. Though, therefore, of design, and, we may say, of necessity, the operations of the mind are limited and adjusted

in conformity with the laws of the physical world, yet we challenge the most ingenious materialist to show that the operations of mind are the product of physical or organic action.

When we reflect on the subject of Power, whether physical or mental, and try to form a conception of it, we are drawn inevitably to conceive it as the action of an unseen and immaterial cause; and we maintain firmly that no thinking man can, in the true sense of the word, ever think himself into Materialism. He becomes, on the contrary, a materialist by refusing to think, by using his eyes and sparing his head. Materialism is the result of taking facts for causes, whether they are suitable or not, and so superseding or stultifying the reason.

Materialism has ever been the stronghold ot Atheism. The following pages may therefore have some interest, from showing that arguments, both physical and metaphysical, may be adduced in proof that matter does not exist. By matter we mean an *entity*, or thing occupying space, in essence different from spirit, and having a self-dependent existence,—the supposed *substratum* of all

the qualities observed in physical objects,—and which, if all these qualities were taken away, would still be there, as the *substantial thing;* they, the properties, being only the adjectives, while it is the thing, or noun. Such is matter, according to the general conception formed of it; and it is against this that we shall direct our arguments.

The writer has already alluded to some strange, and, as it seems to him, extravagant theories which have been supported by men of eminence on the idealistic side—in which matter and the existence of an external world are alike denied; and he has alluded to the contrary, or Sadducean position, dignified by no very eminent names, but yet gaining the acceptance of many shrewd and active prosecutors of natural science, who, holding that matter is the only thing of which we have a sure cognition, reject, or discountenance the venerable doctrine of a spiritual principle, or of any immaterial power not discoverable by the senses.

The writer will endeavour to show that a safer position, intermediate between the belief in Matter, which leads so many philosophers to Atheism, and such Idealism as we have alluded to, which con-

founds the reason and the natural convictions of mankind, may be defended on grounds scientific and philosophical. This is all the length he wishes to go. He wishes to compel no belief,—he shall only endeavour to show that the highest, the soundest, and most consistent arguments are to be found on the side he espouses; while inconsistencies, contradictions, and absurdities range themselves thick on the side of the believer in matter. At the same time, in a case like this, where there is no possibility either of a visible proof, or of a mathematical demonstration, he will be content to be allowed to present the appeal, leaving it to reason to pronounce its own decision upon it.

CHAPTER II.

PHYSICAL PROOFS AGAINST THE EXISTENCE OF MATTER; AND PHYSICAL PROOF OF WHAT SUPPLIES ITS PLACE.

THE common belief of Realists is, that the material world was created by Deity, and is sustained by Him. This broad general view, however, divides itself into two sub-theories, one or other of which must be accepted by every religious Realist who believes in matter.

First, the theory of those who hold that matter is in itself naturally inert, but that it has conferred on it active properties, which enable it to discharge all the operations of a physical world, from the simplest movements caused by gravitation, up to the most complex exercise of animal and vegetable function.

Second, the theory of such as are unable to look upon matter as endowed with such wonderful powers, and who are not willing to admit that a

dead, unconscious thing is capable of conducting the wonderful processes observed in nature. This section, therefore, regard matter as merely the *occasion* or *occasional cause*, as it has been called, of physical events, Deity being held by them as the real or efficient cause; and very evidently the only cause which reason can sanction. Descartes, Malebranche, and a host of able men, have held this second view; and the explanation given by Reid and Stewart of perception, and their modes of expression, in various parts, regarding natural phenomena, would indicate that such was also their opinion; though they refrain from identifying themselves with the party who openly maintained the doctrine that matter is only the *occasional* or *apparent cause*.

The doctrine of matter, under whichsoever of these alternatives we regard it, appears so fraught with difficulty and contradiction, that there is an evident necessity for examining its pretensions, and considering whether the world cannot be better understood when matter, as an *entity*, is entirely discharged from our creed, and a dynamical world is established in its place. The ground

we have for holding this position we shall endeavour to exhibit in as condensed and simple a manner as the subject will admit: stating first the physical and then the metaphysical arguments which have occurred to us.

As a preliminary argument, then, we say that the phenomena met with in prosecuting chemical science, are frequently so marvellous and unexpected, as to raise in the mind of an abstract thinker doubts as to the theory that the atoms with which he is dealing are material atoms. The idea of *matter* or *substance—that which remains* or *stands under the properties*—implies, to every man who considers it, the possession of *certain specific qualities* permanently inherent in each substance or elementary body. This idea, inseparable from the conception of matter, is found to be the reverse of a true one.

The most trifling difference in the proportions in which *substances* are combined frequently creates the most entire change of property. Witness the results of the various combinations of oxygen with carbon, with hydrogen, or with nitrogen; and witness the still more surprising animal and vege-

table productions which result from the united combination of these four simple or elementary substances—the oils, the gums, the dyes, the flesh, the fish, the vegetables, the medicines, the poisons—in fact the countless products and principles, animal and vegetable, composing the vast catalogue of nature, which are nearly all compounded of these four simple substances. Quinine, for instance, is composed of seventy atoms of these four substances, and so is strychnine. The only difference between the poison and the tonic being, that the poison has two atoms less of hydrogen than the tonic—their place being supplied by two atoms of carbon.

All such facts indicate that the ultimate elements and their combinations act dynamically; certainly they do not act in the way we would expect *substances* to act. Consider the atoms as matter, and all seems contradiction. Consider them as dynamical bodies, and the phenomena we observe become comparatively easy to understand, or to conceive.

For example, the tissues of the animal frame are a nicely balanced combination of elementary

atoms. All animal and vegetable tissues are composed of clusters or groups of these atoms, and the nature of the grouping implies, as the organic chemist well knows, that they are held in comparatively feeble combination. What is flesh to-day is corruption to-morrow, resolving itself into new combinations. This is an essential condition, and without it, nutrition, assimilation, and renovation would be impossible; for it is only where all is feebly held together that the transfer of the parts, which is necessary in animal life, can be effected. If, then, we regard our bodies, and the substances we take as food or as medicine, as nicely balanced collocations of specific forces, we can understand how the two may act concurrently, or may act antagonistically—the one group, if we may use ordinary language, nourishing us, or becoming incorporated with our bodies, in whole or in part, while another slightly different collocation may dissolve, or break up, or neutralize, the specific force binding the substance of the animal tissues together; may stifle, or may strengthen, the nervous energy; or may invigorate or paralyze the organ where this vital agent is generated.

Whereas if we regard the substances as composed of matter, having substantial or enduring qualities, it is impossible to account reasonably for the results effected by the most trifling changes in the proportions of the constituent elements of the articles used.

But leaving this. The following facts and considerations of a more specific nature, derived from physical science, when followed up by the reflections they suggest, lead us step by step to the same conclusion—that matter does not exist.

1*st*, All objects in nature act *external to themselves*. The sun acts on the earth, and the earth acts on the moon. The power of attraction between these large bodies, considered as a mechanical force, is enormous. Now, as we know of no *material link* between these bodies which can explain so strange a fact, we are compelled to believe in the existence of this tremendous mechanical or physical force, without the existence of a mechanical agent to produce it.

2*d*, In like manner, it is evident that chemical atoms, when they act on each other, if they be material atoms, must also act *external to themselves*.

Let us conceive these three bodies to be chemical, or ultimate atoms, in a state of what, if

they are material atoms, is incorrectly called *chemical combination*. It is evident they are acting on each other *external to themselves*, and they must ever do so if they be material and ultimate, therefore, according to chemical doctrine, indivisible atoms. It is therefore, here again, even if we adopt the general materialistic theory, not matter which acts on matter, but it is an invisible and immaterial power, external to the atoms, which rules their movements and affinities, and draws them together with that extraordinary force which is known to exist in very many chemical combinations.

In strict language, it is evident there can be no such thing as combination of *material elements*—there can be nothing but a mixing of their parts. Combination, which is necessary to account for chemical changes, is a state only possible with dynamical bodies or forces; for these alone can be combined so as to act with or against each other, by addition to their respective powers,—or

by subtraction therefrom,—or by giving their action a new direction. Thus, and thus alone, can chemical changes and combinations be accounted for.

3*d*, It can be proved that no one portion of matter ever touches another. The elasticity of all bodies proves this. And when it is objected to this argument, that the ultimate parts of matter may be *compressible*—the objection, it will be observed, is a virtual admission of the fact objected to, for it is equivalent to saying that the parts of objects may *come closer*, and that they are not absolutely close. In gases, the intervals between the atoms, even in ordinary circumstances, must be enormous, compared with the size of the atoms themselves; and it would seem that the interval may be indefinitely extended; for it is found that these atoms, even under the nearly fully exhausted receiver of an air-pump, when they are removed infinitely further from each other, still repel each other, acting thus ever external to themselves.

4*th*, A ray of light falling on a polished surface, *e.g.*, on coloured glass, or on a polished mahogany

table, is reflected, without acquiring any of the colour of the body reflecting it. This proves that the action in reflection is excited external to the surface of the glass or other reflecting body, and that none of the reflected ray touches the reflecting surface, so as to have *any of the constituents of the pure ray* absorbed or transmitted, and the reflected ray thereby rendered a coloured ray.

5*th*, We shall give some more elaborate proofs that matter does not act on matter, but force on force. It is known that light when it falls on the polished surface of a transparent polished body, part of the ray is reflected and part is refracted, and passes through the transparent body. In the case of reflection, the angle of reflection is equal to the angle of incidence. Now, Sir John Herschel, in his elaborate article on LIGHT (Ency. Metrop.), shows clearly that this could not be possible if the light actually *touched* the polished surface. "The process of polishing a piece of glass," says he, "is, in fact, nothing more than the rounding down larger asperities into smaller ones, by the use of hard gritty powders,

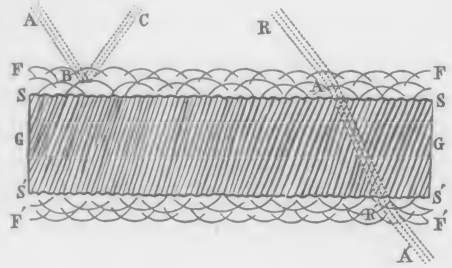
which, whatever degree of mechanical comminution we may give them, are yet but masses, in comparison with the ultimate molecules of matter."

Let us consider the accompanying figure in explanation of the facts of reflection and refraction; and first with regard to reflection:—It will be apparent that the molecules of light, forming the ray AB, or the molecules of the ether propelled forward and backward by luminous vibration, are reflected not at the surface SS of the glass GG, whose roughness would cause it to become scattered, but somewhere at a sensible distance from it, in the zone of force FF, where the action of the only partially polished surface comes into play, and is sufficient to repel it.

6*th*, In the case of refraction again, the bending down of the ray RR, it is equally apparent, is commenced not at the surface of the glass, but at a certain distance above it, in the zone of force FF.

After the ray has entered the supposed substance of the transparent body, or, according to our theory, has passed through the first plane of atomic centres of force at SS, where action will be equal

on all sides, its course, it is well known, is in a straight line, till it passes the lower surface, at S′S′.



Now mark—this passage of the refracted ray RR through a rectangular prism of polished glass, affords to our mind the strongest proof physics can give us that the glass is not a material, but a dynamical body; and we beg the reader's attention to this proof.

When the ray RR has passed through the plane of force commencing at FF, and has reached the supposed substance of the glass at SS, it must be assumed to meet it, owing to the partial roughness of the surface, at every conceivable angle. If, then, the glass were *matter*, it is self-evident that the ray could not impinge upon, and

pass through the rough surface, without being jostled and scattered in every direction. It is, in like manner, equally irreconcilable with the laws of physics that the ray of light should emerge at the lower surface S′S′, which is also—as Sir John Herschel shows—rough, and still maintain its parallel form. Neither light nor any other moving physical body can impinge obliquely upon solid bodies at rest, without being deflected from its course. The fact that the constituent parts of the ray are not so deflected and scattered in passing through the upper and under rough surfaces, is to us a proof that no *matter*, according to the usual conception we have of matter, is *there* to deflect them.

I claim this fact, then, as a proof that the surfaces are not material surfaces, but are to be regarded as the planes of the outermost centres of the atomic forces of which the glass is composed; and the phenomena can, we think, be explained on no other hypothesis than that glass and other transparent bodies are immaterial and dynamical.

7th, The rapidity of the vibrations of luminiferous ether, and the free passage of the ray of light

through transparent bodies, if they do not afford a proof, at least strengthen the probability of these bodies being dynamical and immaterial. For here we have the most rapid movements that can be conceived conducted in the substance often of the densest bodies, such as the diamond, the ruby, glass, water, and crystals. This, it will be allowed, is not easily reconcilable with the usual conception entertained of these bodies being either solid bodies, or bodies composed of innumerable material atoms, held sensibly apart. That the luminous vibration should emerge from such an ordeal unimpaired in strength, and maintaining its original parallelism, is inconsistent with the known laws regulating the transmission either of atmospheric vibrations, or of small projectiles, through the obstructing influence of larger bodies in a state of rest,—or through bodies called solid; while it is quite compatible with the principles which would govern their transmission through a perfectly elastic immaterial medium, freely permeated by the vibrating medium, *i.e.*, through a medium of atomic forces combined closely enough everywhere to interpenetrate each other, and so to afford a

course to the projectiles or to the waves of vibration, free of disturbing lateral action from individual circles of force.

Were the glass composed of separate and independent particles, whether material or dynamical, the effect would be as when the sun shines through a cloud, whose particles reflect and transmit the light at every possible angle. The cloud, if a dense one, reflects the whole light falling upon its upper surface, which thence appears of a brilliant whiteness, while its lower side, which receives no transmitted light, is perfectly dark. If the cloud be less dense, it appears as a white object, and not as one which is transparent, though each particle of it possesses the character of transparency. Now, if the fact of the vesicles of the cloud being apart from each other, and not in dynamical interpenetration, deprives the cloud of transparency—how much more certainly, if we may be allowed to draw an argument from the data with which the materialists furnish us,—how much more certainly would the ray be obstructed and dispersed were the glass, or were the misty particles composing the cloud to consist of particles of matter which

we are told are solid and impenetrable. We are therefore led to conclude, that transparent bodies are composed of atomic circles, whose forces fully interpenetrate each other, and that all other bodies are likewise composed merely of atomic circles of force.

8*th*, Our inability to interrupt the attracting or repelling action of the magnet by the intervention of numerous plates of non-magnetic dense bodies, such as glass, copper, lead, pasteboard, etc., either singly or in combination, affords another presumption, that these bodies interposed do not consist of solid matter, but are the combinations of immaterial forces.

9*th*, And lastly, and to illustrate, as far as possible, the universality of the principle we have been enforcing, we instance the operations of some of the most important laws of nature. All the forces exerted on the earth's surface, if we consider them in detail, are found to operate without the destruction, or alteration, of a single elementary atom; and a good deal of heavy work has been, and is still being accomplished. The mountains have been upheaved,—a notable quantity of the

earth's crust has been ground down,—strata several miles in thickness have been deposited,—Niagara and thousands of other cataracts and rivers have ceaselessly been pouring their floods. All this indicates a force in constant operation, scarcely calculable, it is so great. Other forces have caused the growth of forests, and every variety of vegetation.[1] All this has been accomplished by the forces inherent in the physical world. If we consider it atomically, or with reference to its physical source, it has been effected by the forces of the elementary atoms; and yet, what is strange, these atoms remain unaltered. To explain our meaning by examples with which we are all familiar:—Coal is the principal agent at the disposal of man for the production of physical power. Every ton of coal used in working a steam-engine produces a certain amount of work. Now, we naturally connect the destruction of the coal with the amount of work done. We consider the work as an equivalent for the loss of the coal. And so it is. But

[1] The forces which have executed these operations are derived from various sources,—from the earth, from the sun, from the moon, and from the mysterious principle called vital force, which acts in concert with the sun in rearing up the various vegetable structures.

are the materials forming the coal really lost? They are not. Coal consists mainly of certain proportions of carbon, hydrogen, and earthy matter —not one atom of these is destroyed, lost, or used up, in the production of heat and mechanical force. They are merely loosened from one form of combination, and set abroad in other combinations.

Observe, then, that here we have something given off by the atoms, and yet the atoms remain unaltered. What they have given us is not material, but it is, notwithstanding, most substantial and valuable. The atoms have pumped water from the mine—they have sawn wood, they have ground corn—they have spun several thousand yards of yarn, and yet here are the atoms the same in number and property as before the work was done. Whatever these atoms may be, then, one thing is certain, that force is a thing, or let us say an action, which they can put forth without impairing their own nature, substance, or being. We are not going to explain how they do this, because we wish the attention confined to the simple fact that they do it; and we wish the fact to be viewed in its simplest form, for if we do so, we see at

once, both from the instance given and from some of the previous facts adduced, that a clear demonstration is afforded us that physical force is an immaterial thing, and that the production of this physical force, and its employment in work, do not affect the substance of the bodies producing it.

We shall give now an instance bearing on the same principle, drawn from the phenomena of animal force. It is well known that there is a constant tear and wear of the bodily organs produced by bodily work, and even by the operations of life, and that the organs are restored by food. This being premised, we state it as a fact equally indisputable, that not one of the constituent elements of the food which goes to produce our bodily strength is destroyed or used up in accomplishing this result. They all pass off from the body unaltered in number and quality. This is a very singular fact. Certain elements, or elementary atomic forces are taken into the system, and for a time incorporated with our organs and then expelled at the lungs, and the valuable and available results are the two immaterial products, *heat* and *physical force*. We leave it to the chemist and

physiologist to explain, if they can, precisely, how this is effected through the composition and decomposition of the arrangement of the atoms taken as food; sufficient for our purpose is the fact as we have stated it. We may take it in any practical way we choose. Let us suppose, for instance, that half a pound of meat will send us comfortably to the top of Lochnagar or Cairngorm—or let us consider that six cwt. of good food will maintain a hard-working man for twelve months in health and strength; and yet, in accomplishing this, not one elementary atom is lost, used up, or changed. It is evident that that which performs the work is not the atoms themselves, but an immaterial energy which they possess, and which they are enabled to communicate to our bodies, or to put forth, when incorporated in our organs, and all without impairing their own strength or altering their nature.

It must be remembered, also, that some of the previous physical facts given by us establish that chemical atoms are surrounded by attracting and repelling forces, which prevent our ever reaching the real substance of the atom, if such substance

or nucleus exists, and which repelling forces also prevent the atoms ever coming into contact with each other, and that the atoms therefore act on each other only through the influence of forces external to themselves, even if they be material bodies.

Several questions will, however, be very naturally proposed in opposition to our denial of matter; and first, it will be asked, Do we not see matter? Now, no question can be more easily and confidently answered in the negative than this one. It must be evident, indeed, to every one who takes the trouble to reflect on the nature of this sense, that vision gives us a sensation of form and colour, and that it is produced by an impulse on the optic nerve, caused by the vibratory movements of an elastic medium which extends between the observer and the objects. A sense of this kind, then, which brings us not into contact with objects, and which is cognisant only of colour and form, can evidently give us no insight into the constitution of external objects. That there are external objects is not denied—that they possess physical properties and powers is admitted—but before we

can admit that they are material as well as physical it is reasonable to demand something at least in the form of proof; for the idea, however universally received, is yet, as we have shown, not founded on reason, but is, on the contrary, when examined into, as we mean to do, found to be opposed alike to philosophy and to common-sense.

Let us advance a step further in our inquiries. It will probably be admitted by most readers that the forces of repulsion and attraction which chemical atoms exert, are the efficient and important properties of these atoms—that, in fact, the action of these forces, regulated according to the laws impressed upon each particular elementary substance, is all that we can prove to exist.

It may, however, very reasonably be asked, Is it not probable that there may be a nucleus of matter within the circle of force which we call an atom. This question the reader can best answer for himself. If the forces of whose existence we are alone conscious are the important and efficient properties observed in a physical world and in chemical atoms, what necessity is there to assume the existence within the centre of force of an inert

and insensible part which furnishes no explanation of physical phenomena—which is never seen—which is never felt? Have we no more rational way of explaining the existence of power of which we are conscious? Do we never ask ourselves—How comes the hard insensible centre by its powers? How comes it to possess that which appears rather the attribute of a Divine Being than of an insensible gritty particle? Is it not irrational to suppose a thing to exist which explains nothing? Such are the questions which reason puts.

Suppose these three circles to be atoms in chemical combination, and to represent thus a physical molecule of which the individual circles represent the limits of the efficient action of each atom, and the spots within represent the *material* nucleus. The physical philosopher admits there is a space between the accessible circle of force and the inaccessible nucleus of matter. But what that space is, what is the relative size of the one and the other, he does not attempt to determine. The supposed material centre may be very small—it may

be a mere physical point. We ask, why may it not be a mathematical point—position without magnitude—a nothing? If there be a circle of force which does all the work, what, we ask, is the necessity or the object of imagining an unknown, inaccessible, and inoperative core of matter to exist within? The law of Parsimony imperatively forbids such a supposition, and justifies us in discharging this material core entirely from the atom and from our creed. For it is an established law, which is applicable here if anywhere, that nothing exists in nature which subserves no use, and this, so far as can be shown, is the position of this imaginary entity.

The universe then, in this light, becomes a vast and glorious exhibition of POWER, acting and displayed according to those laws which have been designed and appointed by the Creator, and which laws and system we designate *the Laws of Nature.*

Sir John Leslie, a man of various accomplishments, profound in mathematical science, and most ingenious in all his physical researches, in his Dissertation prefixed to the "Encyclopædia Britannica," seems to exhibit no disfavour to Bosco-

wich's rather fanciful "Theory of Dynamics," except that the material points within his atoms are made mathematical points. The reader may smile, but we regard this *naive* objection as affording an interesting trait of the breadth and versatility of this eminent physicist's mind. Leslie suggests that, in order to get over this prejudice to Boscowich's dynamical atoms, we may conceive the material centres "to have real dimensions, though far *smaller than any assigned measure.*"

Professor Forbes, in his Dissertation in the same work, expresses a difficulty in reconciling this theory of Boscowich to the law of *inertia.* This is probably a chief difficulty felt by most men, namely, to conceive of *inertia* or ponderosity being possessed by immaterial bodies. But this difficulty is entirely one of the mind's own creation, and rests upon a syllogism having false premises, and an inconsecutive conclusion. It arises from our habit of considering that physical bodies are *material* bodies, and arguing illogically on this assumption, that because *they* have inertia, therefore nothing that is not material can have it. The reader will perceive how worthless this argument

is. Surely it is evident that if immaterial atoms may possess that force which, in all natural objects, binds them to one another, no argument can be established on abstract grounds to prove that they may not have that force which draws them when in mass to the earth, or to other larger masses.

If it is thus easy to silence the objection against their possessing *weight*, it is equally easy to prove that if dynamical bodies exist, they must be conceived to possess *inertia* and ponderosity. Let us suppose the smallest mass or molecule of a dynamical body at *rest.* It is evident that *such a body will not move, unless physical force is applied to it. A certain amount of force will be necessary to give it a certain velocity.* If this be admitted, then it follows that if the molecule be increased ten, a hundred, or a thousand times in mass, it must require just ten, a hundred, or a thousand times the amount of force to produce a similar velocity.

So far, then, as we have analogy and argument to guide us, these immaterial bodies must have *inertia.* At least the mouth of a caviller is shut against asserting that they cannot have it.

If any difficulty still remains to prevent our realizing immaterial masses as capable of *inertia*, or the possession of ponderosity, or immobility, the difficulty should vanish when it is kept in mind that all our perceptions of force are only *relative* to our strength, and not *absolute*. If our living bodies, then, and the substance of all external objects, possess the same immaterial nature—as is assumed in our theory—we should not be surprised, but should rather view it as a necessary consequence, that the *inertia* of external immaterial objects should appear in proportion to their masses, and that its amount should have a strict relation to the strength and mass of our percipient bodies: the sentient body, originating the movement, and the inert object moved, being alike composed of the same immaterial substance.

We close our *physical proof* by informing the reader that Professor Faraday, in a paper published in the "Philosophical Magazine" in 1844, avows his belief in the immateriality of physical objects.[1] This conclusion was forced upon him while reflecting on the conduction and isolation of electricity; and also on the remarkable condensation which potassium undergoes when combined with oxygen and hydrogen. He calculated that a certain volume of this metal contained 700 atoms, and that when it is converted into hydrate of potassa, the compound contains 2800 atoms. Its bulk, however, instead of being thereby increased, is reduced by this large addition to little more than one-third the volume of the original metal. This singular collapse of a solid metal, joined no doubt with many other equally surprising anomalies encountered by that ardent investigator, prepared him to regard it, as no absurd whim, but as a very probable conclusion that physical atoms are not *material*, but mere dynamical bodies.

[1] For directing his attention to this fact the author is indebted to Professor Tait, of Edinburgh.

Many more physical proofs than those given above might be found. The writer has only presented such as have occurred to his own mind. He leaves the subject to be prosecuted by such as may take an interest in it, and who may possess greater diligence and a more extensive acquaintance with physical phenomena than he is able to profess.

CHAPTER III.

PHILOSOPHICAL AND COMMON-SENSE ARGUMENTS AGAINST THE EXISTENCE OF MATTER.—THE SIMPLICITY, CONSISTENCY, AND GRANDEUR OF THE OPPOSITE THEORY.

It does not appear necessary to seek, at this time, for more physical facts to support these views. Certain reflections, however, of a metaphysical nature arise in the mind to strengthen the convictions we have avowed in the preceding pages. These have, to persons who can enter into such considerations, a force superior to any which mere physical phenomena can furnish.

The writer is well aware that judgments formed by the mind while engaged in such subtleties, carry weight only with those who have been in the habit of earnestly dealing with them; and the decisions arrived at in this way, we are ready to admit, may be in great measure dependent on the natural and educational idiosyncrasies of the inquirer. Nevertheless, it is no less certain than curious, that when a judgment has once been formed under this appeal of a thinker to his own reason, the conclusions reached are held almost as firmly as if they had been established by demonstration.

All reflection upon the ultimate nature of things impresses with the conviction that there is a mystery connected with our present physical existence,—that in no instance do we know anything of substance, of real existence, of Being; that the nature of things, as they are in themselves, is hid from our perception, and, generally, even from our imagination; and that our knowledge of physical objects is entirely relative. We see certain physical masses affect other masses, and we are conscious of our animal frame being affected by them, but our senses are inadequate to discover either the nature or the cause of the physical changes fleeting around us.

The mind in the perplexity thus occasioned, can only, as we have already said, refer the cause of natural phenomena to a Great Unseen Agent. The question may be asked, Is this a rational and

philosophical conclusion? or is it merely an indolent and superstitious way of terminating a felt difficulty? We hold that it is the only conclusion which reason can come to, and that it is merely indolence, or some mental defect that leads the man of science so often to rest content with the visible and tangible phenomena he has before him, and to be indifferent about working out the important problem of cause.

Regarding, then, the subject of inquiry—Is the world material or immaterial?—the first preliminary question to ask the believer in matter is evidently this, What is the nature of this thing in which you believe? The answer will doubtless be —That matter is a something hard and insensible, but that with our limited faculties we cannot tell its inherent nature, for that all our knowledge of what it is, is limited to the knowledge of what *it does*. This is a fair and a judicious answer. We inquire, then, What is it that this hard or incompressible insensible thing does? What are those functions in a physical world which the materialist feels himself justified in assigning to it? for, knowing this, we shall be able to judge

whether it is likely to discharge the offices assigned to it. We ask, therefore, Has this supposed thing the power of conducting all the operations of nature, including, of course, the formation of plants and animals? The atheistic materialist says it has; and that it evolves, moreover, mind or thought as the natural function of the brain's action.

The religious man who believes in matter, also says that matter has this power; but he saves his religious feelings by holding that the powers of matter are all sustained by the Being who created it, and who gave it its powers. Both these views seem to us equally foolish and untenable.

To the atheist we would adduce proofs geological and astronomical, showing that the world was not eternal, but was created or caused. For, if matter were an independent uncreated thing, a thing which had ever been, we would discover none of those marks of a beginning and of a progress which are exhibited in the earth's crust. We would tell him, moreover, that we discover evidence of design in its plan,—marks of the operation of that mental faculty of intelligence in which he prides himself, and of

which man is the conscious possessor. We would submit these grounds, requesting him to consider whether the forms and the powers of nature can be accounted for otherwise than by predicating an intelligent and designing cause. To the moralist we would have other considerations to offer; and to the metaphysician, others again of a different nature: but to the pure concrete physicist, a being—if such there is—with only one-fourth the human faculties and instincts, we can present nothing to draw him from his physics but arguments of this sort.

To the religious materialist we would present the following questions:—If a material world has been created, and if its powers are sustained by the Being who created it, what function does matter discharge in this arrangement? For if it is to be regarded as always present, but never doing anything, this appears to us to be an exceedingly awkward and ridiculous position for it. To be told that it exists, and that it appears to conduct the operations of nature, but that its ability to conduct such onerous duties is only apparent because all the powers of nature flow

from the Creator, who is also the sustainer of the energy we observe in everything—this makes matter occupy, as we have said, a very ridiculous place, and be, in fact, a nonentity. And we ask, Is it credible that a wise Being should create a thing which is of no use, and which requires thus to be bolstered up. Power is the only thing essential and operative in creation; and a thing which has no inherent power is of no conceivable use, and reason and common sense at once compel us to reject it.

The above is only one difficulty which stands in the way of the believer in matter. There is another, equally intractable, which is this,—the human mind encounters a difficulty, so great as to be almost insurmountable, when it endeavours to conceive a Being whose essence is spiritual, creating a thing of a different essence from himself, which matter is conceived to be. The ancient philosophers of Greece, feeling this, declared that matter was uncreated and eternal. Spinoza, one of the acutest minds, felt the same difficulty, and in his *Ethics* he lays it down as an axiom of reason that "the knowledge of an effect

(the world for instance) depends on the knowledge of the cause, and things that have nothing in common with each other (*e. g.*, matter and spirit) cannot be understood by means of each other." Hence the one cannot be the cause of the other.

It would seem that the views thus expressed by Spinoza, and which are probably held by every man who thinks patiently and clearly on the subject, were also those of Sir W. Hamilton—at least we must infer this. In his Lectures on Causation he says, "If we analyze our thoughts, we shall find that our idea of cause simply means that, as we cannot conceive new existence to commence, therefore all that now is seen to arise under a new appearance had previously an existence under a prior form. When God is said to create out of nothing, we construe this to thought by supposing that he evokes existence out of himself." And again,—"We think the cause to contain all that is contained in the effect,—the effect to contain nothing which is not contained in the cause" (Lectures, vol. ii., pp. 377–378).

It is curious also to find Sir Isaac Newton exercising his mind on the same subject, and

coming substantially to the conclusion that the world was immaterial. "We may be enabled," he is represented as saying in a conversation with Mr Locke, and the Earl of Pembroke,—"We may be enabled to form some rude conception of the creation of matter, if we suppose that God by his power had prevented the entrance of anything into a certain portion of pure space, which is of its nature penetrable, eternal, necessary, infinite,—from henceforward this portion of space would be endowed with impenetrability, one of the essential qualities of matter; and as pure space is absolutely uniform, we have only again to suppose that God communicated the same impenetrability to another portion of space, and we should then obtain, in a certain sort, the notion of the mobility of matter, another quality which is also very essential to it" (see Sir W. Hamilton's Note F on Reid's Works).

We may now present the result of the foregoing facts and reflections in the following propositions:—

1. The existence of matter cannot be proved. We never see it, nor feel it, nor can we form any distinct conception of it.

2. Physical objects we imagine to consist of matter; but their active properties indicate much more rationally their possessing a spiritual than a material essence.

3. Reason does not sanction the existence of an insensible, unconscious, unintelligent *entity* possessing active powers. And that such an entity should have the ability to conduct the complex arrangements of the physical world, appears a supposition so contradictory and absurd, that we feel certain few persons will be found willing to identify themselves with such a theory. For, of course, if matter does *anything*, it does *everything;* and no man can reasonably suggest a point where its operations cease.

4. *Power*, when we reflect closely on its nature and meaning, appears an attribute of an intelligent spiritual being, and not of an unconscious inanimate thing. We can never, indeed, conceive power as an attribute of an unconscious thing, such as we suppose matter to be. And when we see power combined with intelligence, working out useful ends, we can have still less hesitation in attributing it to an intelligent self-conscious spiritual cause.

5. We have shown in the foregoing pages that physical phenomena, when examined closely, prove that physical objects acting in the mass—and physical atoms acting chemically—act external to themselves, and therefore through the medium of an immaterial copula.

6. We have adduced several physical phenomena which are quite incompatible with the belief in matter as an impenetrable entity.

7. We never see the cause of any physical phenomena. We never see a physical cause sufficient to explain or account for any one fundamental *law of physics*. Hume's essay brings this strongly out. We are therefore compelled either to assign an immaterial cause for these laws, or to believe that physical events occur without a cause.

8. If, again, we assume, as the believer in matter does, that the powers of nature are connected with matter, and sustained in it by Deity, we reduce ourselves by such a supposition to the absurdity of believing in the existence everywhere throughout nature of a thing which has no power of its own, and which is therefore superfluous; and we involve ourselves in the

double absurdity of believing that the Diety has created a thing which has neither power nor utility—which, in fact, occupies space, and yet does nothing in it.

9. It has been declared by philosophers in all ages that it is impossible to conceive the creation of an entity like matter out of nothing, by a being having himself a different or spiritual essence, and Sir William Hamilton homologates this opinion.

10. Lastly, let us remember that it is admitted by all philosophers that we never acquire any direct knowledge of matter, or of any other thing, *as a thing in itself.* We merely know of things and learn to describe them by their actings. Keeping this in mind, it is evident that we are, by this circumstance, left at complete liberty to select an *adequate cause* to account for the powers exhibited in external nature, and we are under no necessity whatever to select an insensible and evidently inadequate cause, which matter, by the materialist's own showing, is.

Seeing then, everywhere around us in the world, marks not only of power, but of wisdom, of design, of order, of beauty—the combination

of parts, the many antecedents contributing to produce the definite results, we can have little hesitation in discarding matter, as an entirely insufficient cause whereby to account for all this, and for the constant and methodical flux of physical events; and we can have just as little hesitation in coming to the conclusion that the world is not a material entity at all, but an ever active cause—an immaterial and spiritual cause—a manifestation of power ever working in connexion with intelligence—therefore an ever present intelligent cause in direct operation. The Infinite subjecting his power to finity, and manifesting himself in the laws of time and space, and all those other laws which we call mechanical or physical, and which He himself has appointed as the conditions of this physical world. This is the conclusion, we think, to which reason is compelled to come when it realizes the existence of power in an organic world, and feels the necessity of accounting for it.

If we are brought to the acceptance of this conclusion, then the theory of *perception*, which has so much puzzled metaphysicians, becomes simple; for by the dynamical and immaterial theory of the

world we are brought everywhere in contact with *external power*, whereby our bodily senses are acted on, and the necessary sensation is evoked in the mind, and this we may state as an additional or supplementary argument in favour of our views.

If the only source of power is Deity, then in perception we are brought into direct contact and connexion with the Deity.

It may be said that this was Berkeley's theory, and we may admit that it is so, but with this distinction, and that a very important one:—By our theory the world does not give the constant lie to our reason and our natural belief, which Berkeley's ideal world did. We believe in an external physical world, and in our being possessed of an organic bodily frame. Berkeley believed in neither. Time and space are with us attributes with which Deity in the arrangements of a physical world clothes himself; and wherever the laws of a physical world extend, there the mind, through the senses, is brought into contact with Deity. Deity produces in the mind the necessary sensation which we interpret as being caused by the external object. The generality call these external objects

matter, because they must assign a cause for their properties, and for the permanence and fixity of their laws, and there is no great evil in viewing the world in this light; but so soon as we wish to account to ourselves intelligently, we are driven to a more rational explanation of what our meaning is as to that thing, which we hold to possess the properties and powers which rule in a physical world; and we come to the conclusion, as we have said, that power is of an immaterial and spiritual nature, and therefore, that the world is immaterial and spiritual.

It may be asked by some of our readers, Is not this Pantheism? It is not. It has none of the dangerous features of that heresy. Pantheism annihilates the independent existence of man's mind, and involves all things in the meshes of fatalism. We reserve the freedom of the human will. We regard the soul of man and the sentient principle of the lower animals as created by the Deity, and gifted with that individuality which we and they are conscious of possessing, and having this, we are at liberty to exercise the gift of reason, and to speculate on or to demonstrate the nature of that world which is external to us. Our theory does not

attempt to alter a single principle of theology, nor does it, if it were demonstrated, affect a single principle of science. It is mainly an abstract question, important and practical only in so far as it simplifies philosophy, and gives a sublimer and a more consistent apprehension to the man of religious mind, of the world viewed in connexion with Divine power.

Before leaving this part of our subject we may show the position which is taken by the materialist, and view it as in contrast with our theory. The materialist states his case thus: I admit I see no reason for power being in matter, I simply accept the fact. I see matter, and I see that it possesses active properties or powers, and to believe what one sees is the only safe and sure philosophy.

How many thousands rest on this foundation, proclaiming that it is the only rational principle to believe in what one sees, and yet mark how entirely hollow is their foundation. They who thus profess to rest on a fact are unaware that their fact is no fact, but a mere assumption of the imagination; for it is acknowledged by all who have considered the subject, that we neither see nor feel, nor in any way perceive matter, and that,

whether *de facto* it exists or not, we have no means of proving its existence. This is a formidable objection to their philosophy of fact, and it should be held sufficient. But the foundation being swept away, it may be as well to demolish the superstructure, by showing that if there is no proof of the existence of matter, the materialist exhibits a singular want of judgment and consistency in assuming its existence, and still more in installing it, an unintelligent thing, as the cause, in some way not understood or explained, of the power and motion, the arrangement and government of the universe. And, be it observed, doing this, while at the same time it is admitted, that to construct or put together even the most insignificant machine, requires mind and intelligence.

We cannot better bring our reflections on the external world, as a manifestation of power, to a close, than by directing our attention, for a little, to the modern theory of heat. For in this, if in anything, we shall see that all physical effects are only various operations of the same physical power: and thus the fond belief of an all-embracing unity which the Grecian sages thought and spoke of so

much, but which, with them, was rather an inspired idea than a sure knowledge, will be found, after the lapse of many ages, established in our day, by direct and laborious scientific research.

The most interesting and important discovery of our time has probably been the connexion of heat with *physical force*. They are identical. The one is exactly commensurate with the other, and they are convertible the one into the other. A given quantity of physical or mechanical force produces a definite quantity of heat, and this amount of heat again, if it can be preserved and applied, is reconvertible into exactly the original quantity of mechanical force. How is this?

There is a physical agent existing all around us. We have a certainty of its existence, and we know it to discharge one of the most important offices in creation. We seldom speak of it. The bulk of mankind smile when it is named, as if it had only a fanciful or imaginary existence. The agent of which we speak is the ether which pervades all space. It is an elastic medium. We neither see it, hear it, nor feel it objectively; and from this circumstance the unlearned think it must

be a something of the finest, most subtle, and impalpable character—as indeed its name would imply. Instead of this, we have evidence that it is the most tremendous power which exists in Nature, and the fittest emblem of Divine power by its ubiquity, its grandeur, and the vastness of its operations. It may, indeed, from this not irreverently be called the right hand of Deity; for He stretches it throughout all space, and everywhere it works His will.

Its pressure must almost exceed the bounds of our belief. The writer has never heard any surmise made as to the actual pressure of this world-embracing medium, but we may, by a calculation, assist the mind to some conception of the greatness of its amount.

The velocity of the propagation of vibrations in any elastic medium depends on the relation which the elasticity or tension of the medium bears to the *inertia* or weight of the molecules of which the medium consists. The greater the pressure or tension of the medium, and the lighter the molecules composing it, the greater the velocity of the vibrations propagated through it.

The velocity of sound through air is about 1100 feet a second. The velocity of light is nearly 200,000 miles in the same brief time. We have, of course, no means of ascertaining the fact, but it is probable that the molecules of this wonderful medium of which we speak may be inconceivably light. Let us assume that they are one-hundredth part the weight of a molecule of air: on this supposition the pressure and tension of the ether must be 960,000 times the pressure of our atmosphere; and if we suppose them to be a thousandth part the weight of a molecule of air, the pressure of the ether will be 96,000 times that of the atmosphere; which, let it be remembered, bears with a force of about 15 lbs. on every inch of the surface of the earth and of our bodies. As the ether, however, penetrates all substances, it does not affect them as a weight or pressure. It is only by its movements or vibrations that we have any consciousness of its existence, as it is only by these that it disturbs, or in any way affects physical bodies.

This subtle medium penetrates all substances, even the densest, and is, in fact, the cushion on which the ultimate atoms of all things rest. It

surrounds every atom, and by its movements, which never cease, it keeps them in constant though invisible motion. The mountains, the solid earth, and everything on its surface are thus, as it were, alive with constant motion.

But though its absolute pressure is so tremendous, yet mark how Nature's agents work for Nature's ends. This vast ethereal ocean which, when in any part it is lashed into violent action, has power to dissolve the most obdurate materials —metals, rocks, cities, with their palaces and temples, yielding before it, and becoming reduced to ashes, or resolved into their original elements. This same medium, whose destructive energy is so great, becomes in its ordinary and tamer moods, like the calm ocean which, with soft and musical ripple, plays idly with straws and leaves. In these its gentler movements it appears—so perfect is its elasticity—as if it were mastered even by the weakest and most trifling objects. It is entangled by a cobweb; and in furs, and flannels, and feathers, its vibrations become lost in endless reflexions, and with difficulty do they extricate themselves.

In its wide, but peaceful play, it causes the vapours to ascend from the earth's surface, and the rivers to flow. With an invisible and delicate hand, it also enables the vegetable and animal creation to build up their tender organisms; and though it does not guide their materials to their places, it helps forward the mechanical work. It keeps every atom in constant motion, so that one may pass another as they hurry on under the directing energy of the living organism, to be built each into its proper place. Without it, motion were impossible, and the whole earth, organic and inorganic, would become sealed up in the close lock of an eternal stillness, darkness, and death.

The mighty agent in producing this all-important motion in the ethereal ocean is the sun. He is the great mechanical operator on the earth's surface. This mighty orb, which holds the planets in their places with a power which only astronomers can calculate, and which, while it holds them, bathes them with a constant stream of ethereal vibrations, is at once the great originator and distributor of mechanical power; for, as we have explained, this vibration, which deals not with

masses, but with the atoms of which everything consists, is a mechanical operation of immense power and efficacy.

Whence is this power derived, how is it maintained, and how is it transmitted to us? It is most instructive, in a philosophical point of view, to note how the great Architect has, in a physical world, subjected all His workings to law. And it is especially gratifying to mark how an object so transcendently important as the one we are considering has been accomplished.

This very peculiar vibratory motion of which we speak, originates from a sudden stroke or shock. Science informs us that we have grounds for believing that the sun, by virtue of the mighty attractive power with which he is endowed, draws constantly, though at intervals, to his surface, asteroids and other large bodies from space. That the shock or impulse thus obtained is stored up in his huge bulk in the form of an intense vibratory motion. That this motion, gradually and continuously, is communicated to the elastic ethereal medium which we have described, and that it is by it transmitted with inconceivable speed to

the earth and to all the planets which circle round and form the members of the sun's system.

These vibrations, which differ sensibly in pitch, when they are received in our sentient bodies, affect us with the sensation which we call *heat*,—when they are received on the optic nerve, we call the sensation *light*. Heat and light are thus the bass and the treble notes of the same ethereal instrument, or we may call them twin brother and sister. Heat does all the heavy work, and light possesses all the beauty and the grace; and how useful is she besides!

Let us now sum up. Heat is *physical power* in rapid motion; the attractions of gravity and the attractions and repulsions of chemical action are the same *physical force*, and the entire external world is thus nothing but a manifestation of force or power—a simple and a sublime conception—and one which enters alike the domain of physics, of speculative philosophy, and of theology, and which, in all of these sciences, is of equal importance. It represents the external world and its Creator as of one immaterial and spiritual essence,—power and intelligence infinite being the attribute of the

Creator, and power finite the characteristic of the creation.

We thus get quit of the many difficulties involved in the question of *efficient and occasional causes*, which still so completely puzzle philosophers and divines; for the physical world, in our view, is an exhibition of Divine Power in direct and immediate action, with no intermediate and useless quiddity interposed to puzzle us.

But it may be asked by a metaphysician, What is this *mechanical power or force?* In using these terms we confess that we use words which, though convenient and necessary, we nevertheless cannot properly explain. We cannot analyze or explain any one of the simple and fundamental conceptions of the human mind. What is time? We cannot tell. What is space? What is power? These are the three ever present elements in our conceptions of a physical world. Yet each is entirely incomprehensible, and in attempting to comprehend them reason gets bewildered. Are they entities? Are they relations, applicable exclusively to a physical world? Are they the forms of thought engendered in such a world? Are they the out-

ward garments in which the Infinite chooses in part to conceal, in part to reveal himself to created minds? Such are the questions asked by philosophers. But the whole is a deep mystery, which philosophy cannot solve.

And when we inquire still further, and try to embody into thought the mode of working of the great Cause of all things—the nature, and even the possibility of His existence,—our questionings meet with a still more absolute rebuke. We feel as if standing on the brink of an abyss infinitely profound, from whose hollow comes neither ray of light, nor even the faintest echo of a sound. We turn therefore, though reluctantly, from our insoluble and self-inflicted abstractions to the living world around us. Here we are at once refreshed, and relieved from metaphysical perplexities—for here we see a result pleasing to our nature. We believe in it as an effect—we admire it objectively as a stage fitted up skilfully for the use of sentient beings; and as firmly as we admire the world, with equal firmness—being rational in our nature—do we believe in and admire the invisible cause of this physical result, which is

standing out actual and before our eyes,—a cause greater than the earth and all its furnishings,—a Being, the author at once of the intellectual, the moral, and the physical world.

Thus, through a principle of admiration, love, and faith, do we accept the fact that, out of this seemingly empty infinite, which we had been attempting to consider objectively—but in vain—has welled into being all the forms of life, and beauty, and grandeur which we behold; the starry heavens, the sun, the earth—and man—the most wondrous of all. All these motes have proceeded from what, because not fully comprehended by the metaphysical eye, seemed a moment ago but darkness and nothingness. *Ex nihilo nihil* is an axiom of reason. *Ex invisibili omnia* is the declaration alike of reason and of faith; though it is not, we regret to say, universally so understood by unreasoning men, but only by such as apply their minds lovingly and earnestly to the solution of the problem.

CHAPTER IV.

FURTHER EXPLANATIONS — THE REALITY OF A DYNAMICAL WORLD EXPLAINED—CERTAIN DIFFICULTIES ARE REMOVED BY THIS THEORY.

In the preceding chapters we have established the possibility, and we think also the probability, of the world being immaterial and dynamical. We might therefore leave our readers, according to their judgments, either to accept or reject the theory—or, as is quite as probable, to place it on the list of those many things which are not capable of absolute demonstration.

We are, however, aware how much a new idea must suffer unless it is fully understood. We shall therefore endeavour to protect our views from this disadvantage by giving some additional explanations, in the form of distinct propositions, in which we shall reason out and place in articulate shape the supposed essential points of a dynamical world.

Certain considerations are, moreover, involved in the theory which, though they may not be stated as proofs or as arguments, may yet be presented as recommendations of the theory, from showing that certain substantial advantages attend the reception of it.

PROPOSITIONS.

1. We view the physical world as a vast arrangement of localized forces acting according to definite laws.

2. The laws or modes of action of these forces are prescribed by the Supreme Being, who is the sole efficient agent in the physical world. The external world is thus a manifestation of his ever-present operative power.

3. A physical substance or object we regard as a cluster of atomic forces, having a mutual connexion or relation, and occupying a given space. It is a vacuity in respect that matter does not exist in it; but it is a body and a substance, inasmuch as energy is there expanded round millions of centres, which we may therefore call dynamical atoms or centres of force.

4. Each atom has its position and its law of action, physical and chemical.

5. These atoms are, as we have said, held together by a law of attracting force, and they thus form a body or substance when aggregated.

6. They are solid or impenetrable, for they possess repelling forces; and no other group of dynamical atoms can enter and occupy the same space without encountering and displacing the group previously existing in that place.

7. The atomic forces of one body, when approached to another body, do not necessarily resist such approach; on the contrary, the two may combine, and rearrange their forces, thereby entirely altering the law of their action with reference to other bodies brought within their influence. From their dynamical powers being thus altered, we call the compound a new substance, or a substance having new properties.

8. Substances or bodies are visible or invisible, according as they allow, or as they repel the free movement among their atoms of the whole or any part of the ethereal vibrations which pervade space.

9. Such is the character of physical objects, and

of the whole physical world,—a certain space occupied by forces grouped and acting according to definite laws. They are real existences, true and absolute. What is so true and absolute as the power of the Supreme Being, and those laws which he has prescribed for the regulation of his will in the physical world? They are real, because they exist in space; they are real, because they act on other bodies occupying different spaces; they are real, because they act on our bodies, which are also dynamical and immaterial; and, lastly, *we know them to be real*, because when our bodies are thus acted on, the conscious sensitive principle which we possess is affected thereby, and sensations follow the contact—sensations of vision, touch, heat and cold, taste and smell, etc., according to the nature of the exciting force, and the organ affected thereby.

10. Under the general and comprehensive definitions which we have given—that it is an action betwixt parts which constitutes a body,—a body, as Professor Faraday well remarked, may be said to extend so far as its forces extend. On this principle, we may hold the sun and moon, and

planetary system, as one body. They are bound to one another by the law of attraction, and may therefore, in this sense, be regarded as one body, as truly as the different ends of a piece of iron are considered parts of the iron rod. The similarity is complete, for no one atom of the iron is supposed by the materialist to touch another, but merely to act on it. The fact of motion existing among the different members of our solar system, does not destroy the connexion. There is motion in a river —there is motion in the blood flowing through our bodies; and there is constant molecular motion in the parts of all bodies, whether organic or inorganic.

If gravitation, as is supposed, extends throughout all space, we may, under Professor Faraday's definition, say that the universe is one body, inasmuch as each part acts on the whole, and the whole acts on each part. It is only because the action between distant stars is not reducible to calculation, and because of the feebleness of our apprehensions, that we do not regard them and our planetary system as parts of one system, and as one body; for, if mutual action exists between

them, they are all but as the wheels in the vast cosmical machine, and we know that some great problem of forces must ultimately be wrought out by their action.

11. If the eye could take in the whole universe at once, as it takes in a distant nebula of stars, and if the mind could grasp the mutual relations of its parts, we should view it as an unity in respect of its transcendent completeness.

12. There is an unity in a higher sense, if we regard those forces which constitute the substance of the universe as being the same immaterial energy, acting in accordance with the same code of physical law.

13. And there is an unity in the highest sense, when we regard the regulated and localized power which constitutes the visible creation as a manifestation of the same Divine Power.

Let us now allude to some of the supposed advantages of the theory.

Materialism starts on the assumption that there is matter,—that it is self-dependent, and that it is endowed with certain inherent and inalienable

powers, and that by virtue of these it evolves not only inorganic changes, but also vegetable and animal life and growth—and, as a consequence, sensation and thought. The presence of the Supreme Being is, according to this dangerous belief, virtually unnecessary, and his existence is very frequently denied or lost sight of by thorough Materialists.

It is impossible to conceive the existence of force in operation without a *substratum* or cause. If we assume the Supreme Being to be the cause, it satisfies our reason, and it cuts the foundation from atheistic Materialism.

Idealism takes possession of an abstract and thoughtful or imaginative class of men. It recognises only mind or thought as existing. If it admits a duality of being, which is not always the case, it acknowledges the possibility of the Deity. It deceives us, however, by denying the reality of our perceptions of the world, and thus it makes our belief of externality, and, consequently, our whole life, a deception and a mockery.

A dynamical theory affords a stepping-stone from Idealism back to Realism; perhaps it may also

help the Pantheist to a sounder faith, in so far as it affords a rational explanation of the connexion of the human mind with the external world, and represents the forces of Nature as formed for connecting sentient beings at once with externality and with Deity.

It removes the difficulty experienced by many serious minds in realizing the possibility of a Spiritual Being creating a thing different from his own essence—which matter is supposed to be.

It has the recommendation of being at once simple and rational; for instead of first postulating the creation of an inert thing in space, and then accounting for its operative energies by investing it with immaterial powers, it represents the immaterial operative energy as flowing direct from the Deity, and manifesting itself to his creatures in a physical world.

It settles all questions regarding efficient and occasional causes, making the source of all power the real and efficient cause,—acting at every link of the chain of cause and effect which we witness in external nature, and not applying the hand only at the last and hidden link of the chain.

The theory of an immaterial and dynamical world has also, it seems to us, some interesting bearings in connexion with man's highest hopes and interests. We can only, and with diffidence, offer a few reflections on a subject which is generally regarded as beyond the reach of legitimate speculation. As we approach an inquiry of this kind, where neither reason nor experience, nor any form of proof, can guide us, we are well aware that we at once cease to be philosophers, and become but as children who are talking ignorantly on a mystery which affects their hearts and imaginations, but regarding which they know there is neither revelation to be found in the Bible nor explanation in their catechism—so let it be with us at the present time.

The realization of an inevitable end to mortal existence has its terrors, even with those who have the firmest belief in the reality of a future life. It is the breaking up of our present ties and enjoyments. It is the dissolving of the body, with its various sensibilities. It is a plunge into a state the nature of which we dare scarcely venture to embody in thought. Amidst such shrinkings and

fears, is there not an alleviation afforded by viewing the matter in its truer and more tender light; and considering that it is the Being who through life has sustained our vital forces, and who has given to the organism its every movement, who, at the proper time, comes forward to throw the machine out of gear, in order that it may by-and-by be re-edified on a nobler and more enduring plan?

It is consolatory also to know that the individual forces—the materials which constitute the substance of our bodies—do not perish, but that out of these our bodies may be again constructed.

In our present state we are united to what is called a fleshly body—that is to say, a body composed of certain simple elementary atoms or forces; these, though in themselves subject to no decay, are combined and grouped together so that the organic mass is daily and hourly undergoing decomposition and restoration. A contest is thus constantly waging between life and death, and in which the latter power is destined eventually to triumph, casting us back upon Nature through the successive stages of organic and inorganic condi-

tion, and at last resolving us into the original pure and simple elements. It is natural, therefore, that the terrified and unreflecting mind should personify Death as the king of terrors—as a power who tyrannizes over his human victims, and who is permitted to make us his prey. This is evidently, however, a false and a very reprehensible way of speaking and thinking.

It is surely better to keep nearer to Christianity in our conceptions and language. It is the Being who fitted us for a temporary and trial state, whose hand will, at the time appointed, advisedly, through the operation of his own physical laws, take down the tabernacle, either by a sudden stroke, or deliberately, by loosing the cords and removing the stakes. And we may the more willingly submit to this process, knowing that the best and most revered of men have submitted to it before us; and knowing also that it does not infer an eternal farewell to a physical world—and to our much cherished physical bodies—and feeling assured that the elements of force which connect us with external nature shall be preserved till that day when we may be more worthily clothed in

corporeal humanity—the same in outward lineaments and form, it may be, but subject nèither to waste nor change, nor probably to the necessity of constant nourishment and restoration—that painful arrangement by which the higher or stronger animal borrows life and strength by the destruction of organisms below it in the scale—and incorporates into its substance the life and physical force of unwilling victims.

The highest minds have formed the highest standards of ideal beauty, and the Greeks long since embodied theirs in the Apollo—the perfection of manly and intellectual strength—god-like, yet human; breathing the empyrean air, and yet treading the earth; entirely unsensual, unsordid, unoccupied with bodily wants, and yet the whole lithe body yielding in every movement a sense of pleasure, freedom, and power. It is agreeable to contemplate the possibility of such a lodgment for the human spirit, and that the body shall be sustained, not by incorporating animal or vegetable organisms, but directly by Him who sustains all the elementary forces of Nature, and that it shall therefore be, as they are, imperishable:

that it shall be animated by the indwelling soul, and be subjected fully to its control, its forces being varied, directed, and applied, as the governing will may dictate.

Gravity, incompressibility, and the other physical properties—of whose rigid nature we have such painful experience—we may expect to be, at will, modified or suspended. How vastly the power of locomotion, which is one of the greatest privileges of intelligent physical beings, would be enlarged by such an arrangement, it is unnecessary to specify.

On the supposition that there is matter, we cannot escape from the belief that a heavy and incompressible thing like a millstone is bound up with us. But with the belief in immaterial forces as the substance of all things, what bounds need be put to the versatility of our powers? objects which appear to be solid and impenetrable, such as rocks and walls, may yield at once before us—the forces of the spiritual body neutralizing the resisting forces of inorganic nature, so that, without let or hindrance, man, as lord of the physical world, may pass through their substance. We see something

not unlike this in chemical phenomena when one element, as if by a miracle, entirely annihilates the peculiar energies of another element.

It is singular that some of those important organs which in our present state minister to our intellectual faculties, discharge at the same time an animal function. The brain, which is the organ of thought and voluntary motion, is also an organ essential in digestion and other functions of animal life. The lungs, in like manner, while they are the organs of speech, are also the organs by which the effete matter is removed from the blood: may we not suppose that in a higher state the one class of functions may be retained while the other becomes obsolete, because no longer required?

These are but free, passing imaginings, but in entertaining them as conjectural ideas, it seems as if the doctrine of the resurrection were rendered more conceivable, as if some difficulties were removed, and that state were invested with more definite form. While we believe in matter, difficulties will, in spite of every effort, obtrude themselves. We endeavour to overcome these by arguing that no real difficulty can obstruct the purposes of

an Almighty Power. The mind, however, still remains entangled in its own perplexities. The scripture statements regarding the appearance of Moses and Elias on the Mount—the resurrection of our Lord—his forty days' sojourn on earth—his repeated and sudden appearances in the midst of his disciples—and his as sudden vanishings—his final ascension above the clouds—these will probably, with most men, be quite unintelligible, or they may even become as stones of stumbling, so long as the risen bodies are regarded as material bodies. But how entirely are the difficulties removed when we cease to think of heavy incompressible matter, and accept the theory of immaterial physical bodies, capable of every variety of action.

At present we are the slaves of our bodies rather than their masters;—their wants are so many, their claims and complainings so pressing, their powers so feeble, their substance so unmanageable. All this arises, as we have said, not from the nature of the elements composing them—for these are imperishable—but from the design and method of their present combination. If we are allowed to assume other combinations of the self-

same elements or principles of force, there are no conceivable limits to the powers and capacities which we may believe the body to possess. We are at present kept down both by necessity and inclination to the earth, like the caterpillar to the leaf on which it feeds. But we can apprehend the same immaterial and indestructible forces of Nature instantly, under a different form of combination, becoming the fitting companion for the human spirit—which, as it has been educated under the circumstances of a physical world, is destined, as we are led to believe, to an endless or protracted continuation of a like physical existence.

Such views of a spiritual and yet physical body flow naturally from the theory we have been explaining. We offer them, as we have already said, not as what we wish to press as settled and ascertained on any one's belief, but only as what may be lawfully entertained as possible and probable.

PART II.

THE NATURE OF PERCEPTION.

CHAPTER V.

INTRODUCTORY STATEMENTS AND SPECULATIONS—THE CONNEXION OF MIND AND MATTER.

THE subject of perception is evidently very closely connected with the inquiry which we have been conducting in the preceding chapters. Besides the interest attaching to it as a much contested topic of philosophical inquiry, we enter upon it here from considering that our examination will be found to strengthen the theory we have been recommending—namely, that the world is an exhibition, not of Material, but of Physical power: physical when viewed in its modes of action—spiritual when we look to it with reference to its Nature and its Cause.

If we are to discover the physical constitution of the world, it is evidently important not only that we examine the phenomena presented by the senses, but that we endeavour to understand the nature of the faculties employed in the search. This examination we shall therefore endeavour to make, not arrogating any superior philosophic insight, but simply by the exercise of ordinary intelligence, endeavouring to clear up these two important questions which have so long perplexed and divided philosophers—the questions, What is Perception? and What do we perceive?

If in any measure we succeed in simplifying the subject, it will be because we adopt a simpler stand-point from which to view it. It is evident that much difficulty must arise when, in a philosophical inquiry, we begin by assuming an unsound position, and thus viewing the matter throughout under a false light. It is at least possible, that this may have been the case with many who have undertaken to furnish a theory of the World and of the Perceptive Faculty.

To begin at the root of the matter: it is evident, then, that we perceive something. This

has been denied by none. But what it is that we perceive has ever been the difficulty. It is all but universally admitted that the mind, which is immaterial in its nature, alone perceives. The Idealist holding this sound doctrine—*that the mind alone perceives*, and that it perceives nothing external to itself—concludes either that no external world—in the common sense of the term—exists; or, at least, that we have no indefeasible ground for making any dogmatic assertion on the subject. This may appear to those who have not studied the science of mind, nothing more than an evidence of the imbecility and irrationality of philosophers, and which is only to be accounted for as Festus accounted for the supposed madness of Paul. And yet there are many sober and learned men in our day—and they are, apparently, an increasing class—who proclaim this singular theory as their belief. It is held by them to be the logical conclusion deduced from the ordinary statement of the facts of perception. Thus: the mind is the conscious principle; it is conscious of sensations; these sensations are mental affections; therefore, while we imagine we are perceiving something external,

we are only perceiving a mental affection. Such is the foundation on which the Idealist rests, and beyond which neither his own inclinations, nor the rules of logic permit or prompt him to tread.

Arnauld, the contemporary and friend of Pascal—the great majority of Realists since his time—and among them our gifted countryman Brown—have held substantially the same theory of perception, viz., that the mind does not directly perceive the external world, but only the affections or modifications produced or evoked in itself, by the impulses made by external objects on the organs of sense.

These last-named philosophers, therefore, and a very large and influential school of disciples, differ from the Idealists mainly in this, that the former give credence to the teaching of the senses, and believe in an outer world as the unseen cause of the *mental phenomena* of which—and of which alone—they are conscious; while the Idealists, either from mental peculiarities, or from yielding to a peculiar process of reasoning on the subject, come to a different conclusion, and deny or doubt the existence of everything but mind.

Distinguished from the adherents of either of the above schools, and maintaining *a direct perception or intuition of the outer world*, are Reid, Stewart, and Hamilton. We hope it will be held no disparagement to other gifted writers[1] who take the same view if we say, that it is in connexion with these three names especially that the Scottish school of philosophy has become so extensively known at home and abroad. The question involved, which has divided so many able men, is eminently worthy of consideration.

In examining into the deliverances of the various senses, a main difficulty is to discharge from the mind all the knowledge and all the judgments which time and experience have imported into it. If we could be men in power of observation, but babes in knowledge, we would then be in the condition most fit for observing and recording the simple forms of these all-important letters of the universal human alphabet—our sensations. But we have been through life so accustomed to associate the

[1] Among these we may mention Professor Mansel of Oxford, who, while he differs on some points, generally very closely adheres to the sentiments of Hamilton.

signs with the things signified—or rather, to direct the mind away from the sign to the thing it comes to represent—that it is with extreme difficulty that, in our process of philosophizing, we succeed in holding them asunder, and viewing the element apart from the object it suggests.

According to the writer's views, we have a direct consciousness of all our *Mental Powers;* but the *Sensations* or *Mental Affections* which our senses excite within us, are the only *Objects* which we perceive directly. We have a direct intuition or cognition of these, but we have no direct cognition or intuition of the Outer World. We may mention, however, at the same time, that, according to our views, we are able, by indirect means, to establish its existence.

These sensations of which we speak, and which are the media of our intercourse with the outer world, are the product of the connexion of mind with the movements of the nervous system; or, to speak more precisely, with the movements of that subtle agent of which the nerves are the channels. The sensations are in the mind; they are perceived by the mind; and the brain is the sensorium where they are so perceived.

When we endeavour to be more specific, there are two ways in which our conceptions of the subject may be expressed. We may conceive that the sensations are the forms of perception which the author of our being has permitted us, of those nervous vibrations, or states of action of which we have spoken,—or we may view the matter in a somewhat different light, and hold that the sensations are excited in the mind by these nervous movements—the mind being, as it were, passive in being so affected—and intelligent and active, only in so far as it exercises its perceptive powers, in examining, comparing, and judging these, its own sensations,—viewing them all along, be it remembered, as external objects and qualities.

We state the nature of this action or passion of the mind in different ways, in order that we may hereafter examine the merits of each. This investigation has generally been evaded by Scottish metaphysicians, on the ground that it is impossible to pronounce any positive judgment on a thing so obscure as the intercourse of mind with matter, or on the nearly equally obscure nature of the internal actions of that organ with which the mind

is immediately connected. We feel disposed, however, to ascribe much of this evasion of the subject either to the little interest which ardent students of mental philosophy have generally taken in physics, —or to a traditional aversion to connect in any way a physical element with a psychological operation.

There is a vulgar Materialism which—unable to recognise anything unseen and unfelt—reduces man to the condition of a machine, and represents him as being affected, as such, exclusively by outward physical impressions; and which regards him as working out thought by means of the circulations and vibrations occurring in the brain and nervous system. In censure of this grosser form of Materialism we have already spoken.

But there is a subtler form of modern opinion probably gaining some ground; and it is said, Why not admit that the percipient principle and the body may be of one essence? and seeing that by the senses we can know only the physical laws of Nature, why not grant that in physical objects unseen powers may also be inherent, and that what we call matter, or material or physical substance, may, besides the physical properties which we know

it to possess, have also—at least when organized—the power of thought and feeling, and be thus as capable of spiritual, as it is of physical functions?

At first sight, this supposition might appear not impossible. It has even a certain semblance of philosophical truth in it—the holding that the same material substance, about the nature of which we know so little, may possess both physical powers and powers of thought. Unfortunately, however, for such a theory, when the Materialist comes to reflect on the nature of this material substance in which he believes, he finds he has already invested it with a definite nature of its own: he has already declared it insensible, and the subject of certain rigid physical properties; and with all his efforts he cannot succeed in combining with these the very different attributes involved in his conceptions of intelligence. Even in the face of his own assertions to the contrary, he therefore mentally postulates a separate thinking being, connected with the animal organism, but not of its substance.

There is, indeed, no difficulty in imagining rocks and trees to be endued with human sensibilities. This was a favourite fancy of the poets. But here,

as we have said, it is not matter, as such, that possesses these powers, it is a sentient being whom we instinctively install within the insensible prison-house,—the matter itself—the stone or the wood we never succeed in conceiving as either the possessor of feeling or of thought.

Many obvious objections, moreover, present themselves to such a theory. Thus, as it is only in so far as this physico-spiritual substance is organized, and arranged into some one or other of the forms of animal life, that it is ever imagined to possess consciousness and thought; so from this it would seem to follow as a necessary consequence, that *the law of the physical organism must be held* to *correspond with the law of thought.* The physical machine is thus constituted the cause, and constructor of every mental process; and thought becomes the immediate product of physical movements. How directly adverse to such a theory are all the operations of mind! How can physical movements be conceived to produce the workings of imagination,—the belief in the future and the unseen,—the sense of duty—the consciousness of power—the assertions of self-will—

or the mental bias, not only towards selfish, but towards social, moral, and spiritual objects? All these mental phenomena seem quite inexplicable on the machine theory.

If we are to believe that we have freedom of will, and any direction of our thoughts and actions, it would seem that this must necessarily involve the belief in a duality of existence—of a distinct, free, thinking being, to will and act,—and of a machine or organism, to be acted on.

Another objection to the theory of the brain being the producer of thought, and which must ever make it unsatisfactory, even if stronger objections to it were awanting, is, that it implies that there will be a total cessation of thought and consciousness with the dissolution of animal life.

Some other hypothesis must therefore be sought for; and a speculative mind may be led to theorize on the nature of that self-asserting principle which we call I,—not so much perhaps with a hope of arriving definitely at any one particular opinion, as with a view to satisfy itself that other theories more plausible and consistent, and less painful than that of the thought-producing machine, may be maintained.

And, *first*, let us place ourselves in the position of those who hold the popular belief in mind and matter; and, assuming this position, we are willing to admit that we can discover no insuperable obstacle to embarrass the supporters of this ancient—and shall we say antiquated?—form of belief, which supposes an intercourse between these two opposite essences. The larger section of mankind believe that the Deity is a spirit: and yet they experience no difficulty in conceiving him to act on matter and to maintain the laws of Nature. They who believe this should certainly, in consistency with their theory, experience no difficulty in conceiving the mind of man, which they believe to be formed of the like spiritual essence, to be gifted with the possession of a like ability, though in an inferior and subordinate measure and degree; and thus to act on matter as its author does—at least on that finer manifestation of it which pervades the body, and which we call the nervous medium—an elastic imponderable agent, which, indeed, obeys certain physical laws, but which, even to the believer in matter, appears to hold a place intermediate between material and physical. Such an agent

must appear a not unsuitable medium for conducting the action and reaction which exists between the spiritual and the material part of our being.

If it be objected, that the mind is neither directly conscious of the existence of this medium in the body, nor of the method of its acting, we reply—neither are we conscious of how the heart expands and contracts its chambers, and yet it does so nearly 100,000 times every twenty-four hours; nor are we conscious of the position or mode of action of any of our internal organs, and yet our lives are dependent on the steady and continual action of these parts. If, then, these organs act without our knowledge or direction, we may surely admit it as less difficult to believe that the mind may act on matter, and matter on mind, though we may not be conscious how the power is brought into exercise.

In the *second* place, and as another hypothesis, we may imagine a more refined Materialism, maintaining,—that the thinking principle is created with a constitution and organization of its own; that it is material in its essence, but that its materiality is of a most subtle kind; that it is indestructible,—all matter is held to be so in its constituent elements, though not discovered to be so, in any form of organization with which we are acquainted; we cannot annihilate one atom of any object that exists, though we may re-arrange the elements of which it is composed. This being the case, we may allow the Materialist to form his theory, of a thinking principle, consisting of the elements of which we have an acquaintance, but combined and organized on an enduring and indestructible basis, —possessed of a form and individuality of its own, —not nourished as is the body,—not depending on the body for its existence or action,—not subject to disease or dissolution,—in every respect a being distinct from the body, though held for a time in connexion with it; capable on the one hand, by virtue of its materiality, of being acted on through the body, and capable, by virtue of this same materiality, of giving effect to its powers of thought and volition, and thereby originating and directing the movements of the bodily organism.

But let us rather now, in the *third* and *last* place, introduce what appears to us a more philosophical hypothesis. If the theory of an immaterial and

dynamical world is accepted, the speculations which may be suggested on this very difficult inquiry, assume form and consistency, and are relieved of very much of the difficulty which has hitherto attached to all speculations on such a subject; for, if we recognise the world to be a manifestation of Divine power, we can experience surely no difficulty in conceiving the mind to receive the impressions of sense, by virtue of its connexion with the outer world; the Great Cause being thus held to communicate to his creatures a knowledge of external nature through the bodily organs, which are themselves but parts of the one divine physical system. And as regards the reverse action of the mind on external nature, we can view it in like manner, as—by virtue of the powers committed to it, acting through the bodily organs on that Power who, in limitation of his absolute being, has constituted himself at once the passive and the active energy of a world ruled by physical law.

On this hypothesis, of the world and of our bodies being immaterial, yet organized and physical, we can, without any danger of confounding mind with

matter, admit, what is indeed very evident, that the brain is specially connected with the operations of mind, and is thus, in this restricted sense, very properly regarded as the organ of thought. This is very different, however, from viewing it as the producer of thought.

But a danger yet remains; for even though we held that the brain and all physical things were immaterial, still if we supported the theory that its action produced thought, our views, we conceive, would be nearly as objectionable as those of the Materialist; for thought would thus still be represented as dependent on the working of a perishable organ; and thought, moreover, being represented by such a theory as the product of a physical machine, the necessary inference would still exist, that it must follow the laws of physics, and be thereby incapable of all spontaneous action. Who would not regard this, both as a degrading position and as one inconsistent with the lessons of our mental consciousness?

There is, however, no necessity of approaching any such mechanical theory of thought. The belief in a Separate Thinking Principle or Being

is, it would seem, both more philosophical, and infinitely more accordant with consciousness. We are told in our oldest book of Cosmogony, and in very striking language, that God breathed into man the breath of life, and he became a living spirit. This venerable tenet, that the thinking principle has an individuality apart from the body, is thus, it would appear, most accordant at once with the natural, the religious, and the better philosophical opinions of mankind in general.

Whether this self-conscious principle occupies the whole body, or resides in the brain as its special organ, we shall by and by consider. In either view, we necessarily conceive it to occupy space, and, doing so, to possess form. Then, again, being in connexion with the terminations of the nerves of sense, situated in the brain,—in order that it may receive impressions, conduct thought, and execute its will, in accordance with the laws of its physical connexion—it is difficult to escape asking ourselves whether it may not also have something analogous to organization.

We conceive it to be immaterial and indestructible, except by the Being who gives it existence.

It would be rash, indeed, to declare that it has a definite form; all we would wish to indicate is, that we know it to possess and occupy a special physical organ; so we must suppose it to be present throughout the entire of that organ, and to possess, in its present physical connexion, a definite form and definite bounds.

From our traditional habit of grossly regarding physical objects as material, instead of correctly viewing all things as parts of a divine system, we naturally recoil from the idea of the soul possessing certain physical powers or properties; and yet there is a propriety in holding that the intellectual principle, which not only thinks but *acts*, must possess certain physical powers; indeed, how are we to mark the distinction between acting on physical objects (which it does in moving the limbs), and possessing physical powers—between being acted on by the impressions of sense, and possessing physical properties and susceptibilities? Do we forget that we have represented the whole world as being Divine power acting under physical law? And if we regard this view as worthy of our acceptance, on what ground can we reject

the idea that the subordinate and feebler spiritual principle possessed by man, may not, for the purposes of its connexion with a physical world, be likewise temporarily subjected to certain of these same physical laws, and to the organization or mode of action which may be necessary for maintaining, or rendering effectual, its earthly and physical connexion? But this, so far as regards its organization, we merely moot as a subject of thought.

That the nature of its physical connexion is at present limited in this way would, it is evident, be no disparagement to its higher and spiritual nature, at least when it is taken in connexion with our immaterial theory; it carries no dangerous consequences with it—it contradicts no religious tenets—it falls easily in with the general belief; and it seems to remove the difficulty which in all ages has attached to the subject of mind and matter, and their mutual intercourse. For, if the mind is immaterial, and at the same time has the command of certain physical powers in addition to its higher power of thought, we may admit the intercourse between it and the immaterial physical world to be not only possible, but in great measure intelligible.

With reference to the surmise thrown out—as a provocative of thought—regarding the soul being organized: It was offered merely to mark our inability to realize a true unity of being. We do not for a moment imagine any organs in a spiritual thinking principle; nor do we imagine any localization of its different functions. We distinctly hold the mind to be spiritual, indestructible, indivisible,—in an absolute sense to be One. When the action of the optic nerve affects the brain, then—not one part, but—the whole mind is filled with the sensation of light. When the action of the auditory nerve reaches the brain, and affects it—then the whole mind is filled with the sensation of sound. When a sharp point pierces the hand, the whole mind is filled with pain. Every sensation thus belongs to the whole mind.

Likewise, it is the whole mind which wills—it is the whole mind which acts. It is indeed frequently found to hesitate under conflicting motives, and to hang irresolute and uncertain over its ill-defined and unsettled judgments; but it never exhibits any indications of being locally and physically divided, or of possessing different centres of action.

Still, though thus an individual unity, we must remember that all the physical impressions enter the brain by distinct and separate portals,—that their action is confined to particular lobes of the brain—that in these lobes or chambers the mind becomes conscious of, or is affected by, particular physical impressions. It must in like manner be kept in view, that it is through certain organs of the brain the mind acts on the different parts of the body. This, then, is the only species of organization we can discover. It will be evident, therefore, that it is much more correct to say that the mind, in the exercise of these operations, is subjected to limitations suited to the nature and objects of its physical connexion,—than to say that it is organized.

But, query, Can it be supposed to feel at different parts? It has been the error of some philosophers to hold that the mind perceives at the external organs of sense; but this, as we shall by and by show, has been recently disproved by the friendly assistance of scientific investigators. Does it then feel at the particular part of the brain affected? It does not. It is ever the I. It is the whole sentient

being that feels. It knows nothing of the portion of the brain which may be affected. It has no such discriminating power; and there is evidently no object to be gained by its having any such knowledge. The mind, on the contrary, seems entirely passive in the reception of all its physical sensations: all we are certain of by consciousness is, that we are so and so affected.

But mark the active character of the mind, in the discharge of its proper functions. It knows not the part of the brain affected, but it exercises a higher and more intellectual power. It instantly and entirely identifies its sensations with the exciting cause situated in the limb affected. So thoroughly does the mind realize the fact that the sensation originates, not in the brain, but in an outlying department of the body, that, as a wise and paternal monarch, it thinks not at all directly of its suffering self, nor of the official agent which brought the message, but solely and exclusively of the distant cause of the disturbance.

It is arranged by a law of consummate wisdom and utility that it should be so: and equally wise

shall we find every other arrangement in nature. So much is this the case, that it has ever been one of man's chief enjoyments to discover causes, and to mark laws and rules of action.

Exercising ourselves, therefore, in this way, let us remark—That the nerves of sensation proceed from nearly every part of the body, and that they have their terminations in definite portions of the brain. This circumstance at once suggests an explanation of the singular and important law which we have been considering—namely, that the mind perceives its sensations, not as if they existed in itself, nor as if they existed in the brain, but as if they were located in the part of the body affected.

By the arrangement of the nervous system above alluded to, it is evident that by means of the nerves entering the brain, the whole body is practically represented in that organ;—the body is in fact epitomized in the brain.

We may even conjecture that this epitomizing of the whole sensitive parts of the body in the brain is rendered effectual by means of a grouping and arranging of the nervous centres, suited to produce

a knowledge of the position of the limbs they represent.[1]

Then, as regards the message transmitted to the cerebral organ, we can speak experimentally; for, whatever the nature of their action on the brain may be, we know the wonderfully nice and varied distinction of signs and utterances which the nerves of sensation communicate to the mind.

The connexion of the mind with the physical world, we freely admit, is a mystery, but so is every operation in nature; we never discover the ultimate cause: we only see certain links of the chain. Let us never, however, despise the knowledge, be it much or be it little, which we may be permitted to obtain.

We would remark, then, in connexion with the above considerations; that man has both instinctive or intuitional knowledge, and a knowledge accumulated by experience. It is often exceedingly difficult to determine where the one ends and the other begins: or how far both are existing and operating together. For example, how comes it

[1] The internal organs of the body generally have no direct connexion with the brain, but with the ganglionic system.

that the mind should perceive its sensations as if they were situated, not in the brain, but in the precise part of the body which is affected? It would be quite correct were we to reply that it is by virtue of a law of its nature that the mind perceives at all, and therefore that we cannot doubt that it is also in conformity with a law that the mind—we do not say perceives, but seems to perceive, the sensations as resident where they certainly are not. Now, though this may be a correct answer, yet it should not foreclose further inquiry, for when we examine, we generally discover that every law is carried out by appropriate means; and we are frequently permitted to discover some of those means or outward steps by which the law comes into operation.

May the particular grouping, therefore, of the nervous terminations in the brain not be regarded as a means whereby the sentient principle has a knowledge of the local arrangement of the parts of the external body? And may the distinction in the quality of the nervous sign, rendered by the nerves of general sensibility, not in some measure depend on the distance of the part of the body from

which the nerve proceeds—in other words, on the length of the nerve? We may illustrate our meaning in this way: When a submarine telegraphic wire is snapped, those who have acquired a knowledge of the outward manifestation of the wonderful power which darts through the wires, can tell, by the nature of the return made through the broken wire, how far off under the Atlantic the fracture occurs. This is beautifully called the answer from the sea; and this message may illustrate what we call the sensation from the limb affected. The message in the one case is perceived and judged of in the telegraphic office, and, in the other case, in the chamber of the brain; but they both speak of conditions of being, existing in an inaccessible quarter.

If we can judge thus by means of the imperfect utterances of a damaged machine of man's construction, we may see something like a physical fact to explain how that intelligent principle which resides in an organ not made by human hands—not damaged—but put in perfect and finished connexion with the body—may far more certainly and nicely pronounce on the parts of the external body

which are being subjected to internal or externa physical disturbance—and which parts are, through their own special nerves, transmitting a nervous action to the brain.

That we have an original and instinctive feeling of externality we cannot question. Every part of the body is sensitive, and therefore the first bodily movement by an infant, must excite an extended muscular and nervous action, which will be represented by a corresponding extended action in the cephalic organ. But yet the knowledge thus acquired of an extended physical body is not at once perfect. An infant has not the same ready perception of the site of a bodily injury that an adult has. We must all have observed that when a child—it may even be so much as two or three years of age—receives a sudden sharp stroke, it can but very imperfectly tell in what part of its body the injury exists. It appears rather as if its whole being were convulsed with pain, than that any particular part suffers. This must lead us to conclude that our physical sensations and powers are at least enlarged and perfected by experience.

But we have ventured further on this inquiry than we anticipated, and we must therefore bring this chapter to a close. We submit these reflections, hoping they may help to explain both the physical and the spiritual structure of our theory—these two aspects in it being, in our opinion, one and inseparable. By viewing the matter in this light, we think we may form some consistent notion both of the actions, and of the passive affections, of that percipient spiritual Ego which, in the operation of animal life, acts and suffers in conformity with the laws which govern its physical associate, the body.

The explanations we have given are alone tenable when taken in connexion with our peculiar views, which regard the world—animal and vegetable—organic and inorganic—as but one connected Divine operative system. Unless this is kept constantly in view, our explanations of mental perception and mental action may be misunderstood, and objected to as appearing too much connected with physical laws.

The belief in matter has had the worst effect on the mind of Christendom. It has frequently led

men to close their eyes against the facts of science; and it has prevented our forming a just and comprehensive conception of the method of the Divine government in the physical world. When any great cosmical event is explained by the operation of physical law, a terror is immediately experienced; and it is objected that the explanation is making matter do what can only be performed by Deity. The most important discoveries have, on this principle, frequently been refused acceptance Now, whether there be matter or whether there be none, is it not evident that the operations of Nature are the operations of God?

Much, indeed, do we prefer regarding matter as a mere phantasm of the imagination: but our objection to it is not that of the timid, who think that matter does too much; our objection to it is, that, while we cannot find that it does anything at all, or even that it exists, the belief in it is constantly obstructing the course of free inquiry, and compelling timid but pious men to dissociate the laws of Nature from the Being who is their author.

CHAPTER VI.

HAVE WE A DIRECT AND INTUITIONAL PERCEPTION OF EXTERNAL NATURE, AS HAMILTON GENERALLY ASSERTS?

We quit now the speculations of the preceding chapter, in order to enter upon our special inquiry, which is: What do the senses teach us? and what do we really know of the external world?

We have felt much dissatisfaction with not a few who have written on this subject, from finding that, instead of taking some pains to discover precisely what the senses reveal to us, they keep entirely to generalities, repeating the phrases employed in the dawn of Greek philosophy. We know the world only, say they, through sensations. Sensations are not like the external realities, and therefore we know nothing truly and certainly of the world. This is a mere repetition of the lispings of philosophy, and is unworthy of our

times. If the senses reveal anything at all, why should that not be stated, that we may judge of its nature? But this these writers seem not disposed to do.

We can imagine a gelatinous animal of the lowest order, whose destiny it was to be rooted to a rock, and to be sustained by the involuntary absorption of the fluid in which it was immersed, exercising itself simply in attending to the quality of its sensations, without inquiry into the fact of their having any external cause. Such an animal, if such there were, would acquire no knowledge whatever of the world, or of anything external to itself. It would only know of the quality of its own sensations. Now, very much in this position does it please some writers to represent man as being placed by reason of the limitation of his means of knowledge. But man is not thus circumstanced, and especially he acts not as this imaginary mollusc. His senses give him the means of knowing much, as we in this nineteenth century should be ready to acknowledge; and his mind prompts him to continual further inquiry.

We know the world, indeed, only through sen-

sations, and we are told these sensations are not like the external causes producing them. It is said: How can mere sensations or feelings, which are in the mind, be like a knife, or like salt or pepper, or a pianoforte, or a drum, or fife? or like vibrations of the air, or of any other medium? We admit that some of our sensations, if we speak only of their character or quality, are like nothing external—they are merely pleasant or unpleasant affections caused by impressions made on the body. In so far, then, as they are such affections, they neither agree with the external cause, nor give us any accurate knowledge of it. Such pre-eminently are the sensations of taste and smell, of heat and cold, of sound and light. But yet it is no less true that our sensations afford us sufficient data to assign a definition of the nature of their exciting causes. For if this is not the case, science is a mere mockery and man is an irrational being, the sport of some higher power.

But before we commence any examination of the sensations, let us remark that, though without our sensations we could know nothing of the world, yet it is very far from true that sensations consti-

tute the sum total of our cosmical knowledge. It is in the possession of Animal Will and powers of locomotion on the one hand,—and in the resistance of the world to the free exercise of these prerogatives of animal life on the other—it is in the opposition of these two factors that our consciousness of the outer world, and of ourselves as parts of it, arises and exists. The sensations without the active animal will, would be entirely insufficient: with the sensations alone we would be lower and more ignorant than the lowest mollusc.

Having thus far cleared the way, let us, in the first place, observe, regarding our sensations, that they have each and all of them a distinctive character, which enables us to distinguish the one from the other, even as we know one letter of the alphabet from another.

Again, we can discover by the judging faculty, that the character or quality of each class of sensations is dependent not only on the organ affected but also on the nature of the physical impulse given.

Again, although all we know, or think, or feel of the world is in the mind,—yet our rational nature,

applying itself to the consideration of the phenomena of sense, gives us assurance that what we know, and think, and feel, is dependent on the nature of the objects causing our sensations. We can even, in some measure, account for the distinctive character of the impressions of the different senses: thus, taste is a faint chemical or *quasi*-chemical action on the nerves in immediate proximity with the food, and, as such, the sensation is in harmony with the physical cause. Taste has in itself no meaning, except that it affects the organ agreeably or disagreeably; and this is all, judging from the action of the excitant, that we could require or expect of it.

Smell is nearly the same in its nature, and in its exciting cause, except that the excitant is applied in a volatile, and not in a solid or fluid condition.

Sound is produced by a motion so rapid that its separate beats on the organ cannot be counted; and, therefore, the sensation of sound has a clear, continuous effect, gentle or arousing, according to the changes wrought in the flow of the external impulse; but we cannot distinguish the rapid

beat given by each pulse of vibration—we can merely, by means of ingenious contrivances, ascertain their number and velocity. Sound, therefore, though so important a means of transmitting knowledge, and so conducive to our enjoyments, conveys, as a sensation, no special meaning to us, and we see the reason of this.

If we might speculate on the physiological cause of sound being pleasing, we might say, that all animal life and enjoyment largely depend on motion—on the motion not only of the limbs and blood, but also of the molecules of which our physical system consists (see Chap. III., pp. 66-70; and the rapid movements caused in our auditory nerves, and consequently in the brain, by the vibrations of sound, we may reasonably assign as a sufficient explanation of the pleasure we experience in attending to sound, simply as such, irrespective of melody or any special agreeable association.

Light, or colour, is another marvellous exhibition of sensation, excited by a still more rapid succession of impulses impressed on the nerve of sight; and we can in part understand how such rapid

and sharp movements should produce the pleasing, thrilling, but pre-eminently subjective sensations of colour.

The sensation of touch—as, for instance, the pressure of the hand on the body—is a simple affection of the parts in contact. A succession of pats of the hand is intelligible as a repetition of the simple act of pressure. A rapid, light repetition of touch, passes into a sensation of tickling, which, as it is spasmodic, is not so intelligible as pressure, or as pats which may be counted.

All this we give merely to enforce what we have said, that though sensations are in the mind, yet the difference in their character or quality has perhaps always a certain intelligible dependence on the nature of their exciting cause. Metaphysicians are sometimes addicted to make everything external unintelligible; our desire is here, in as far as possible, to explain and simplify the nature of our perceptions.

Certain of our most important sensations, individually, or by themselves, we admit would impart to us no very distinct objective information. Thus, hearing, to a being unconscious of possessing a

physical body, without the sense of touch, and without the power of locomotion, would appear, we imagine, as a purely subjective, involuntary act of consciousness, and not as proceeding from any outward cause.

In vision it is otherwise; a knowledge of extension is communicated along with the sensation of colour, or of light. The sensation excited by the impulse on the retina, is a coloured form. The form corresponds with that of the external object—the colour has no such correspondence. The colour is the quality of the sensation produced in the mind, and it is evident that colour is entirely unlike the external cause exciting it. The cause, is a succession of rapid impulses, of an invisible elastic medium, upon the retina; the mental effect, is light and colour. There is neither light nor colour in external nature; they are in the mind alone. This is a consideration calculated to create our highest wonder; and we can scarcely escape perceiving that the transformation of a rapid vibration into so glorious a mental phenomenon as colour, marks, in a very striking manner, the finger of Deity, and his design that our intercourse with the

world should be one of enjoyment and admiration, and not of intelligence alone. Were it not so, vision would have presented Nature to us not as a picture, not even as an engraving, but merely as a refined apprehension of touch and motion.

It is by the exercise of judgment upon the deliverances of *touch*, that we perceive, or come to acquire a knowledge of the *physical* properties of the external world. We here employ the term touch in its large and not in that restricted sense applicable to skin sensations, which Sir W. Hamilton has rather unhappily selected as most explanatory of the direct intercourse of mind with external nature ("Lectures on Metaphysics," chap. xxv.). By touch we mean that sense by which we are conscious of sensations when any part of our bodily frame is touched, whether forcibly or gently—by which, also, we have peculiar sensations when we move our limbs—by which we have what we come to call a sensation of tension and strain, or effort in the limbs when we exert them violently—of pain when we overtask their powers, or when an injury is inflicted—of restlessness and irritability when we desire or

require exercise—of fatigue and langour when we have protracted our bodily exercise;—all these we would embrace under this general term,—the sense of touch, or general sensibility. It is entirely through these sensations that we come to form a conception of the primary qualities of an external world.

By sight alone, especially if joined with the faculty of locomotion, we would doubtless be led to believe in an extended, or external world, but we should evidently know nothing of its primary physical properties—its solidity, its hardness, its resisting powers—or, in comprehensive language, its physical forces. Without these it would appear to us as a mere picture—a dream—a shifting, unresisting, unsubstantial mirage. We learn the primary qualities of the world by the opposition which physical objects offer to our efforts to compress them—to force our way through them—to draw their parts asunder—to stop their motion—to overcome their inertia or weight.

We shall best make the subject of perception, as we view it, intelligible, by laying before the reader, in as condensed a form as possible, the

views of the most distinguished Realists our country has produced—namely, those of Reid, Stewart, and Hamilton. We shall then make some comments on the explanations these writers offer on this important subject, dwelling especially on the exposition Hamilton gives of his own views, which, it will be found, differ in many respects from those of Reid and Stewart, so far as these can be ascertained, a matter by no means always easy to accomplish.

It is by examining critically the views of others, and by placing fact against fact, and argument against argument, that we can best elucidate and enjoy the subject. If in the act of doing this, there should appear a lack of reverence, we fear this can not be always avoided. The subject is pre-eminently one on which there can be no compromise: each man must speak as he thinks, and with the consciousness that his thinking, if it be examined at all, will be subjected to a like unsparing criticism. In conducting all such examinations, we may, or we may not feel the temptation to be trenchant; but we must feel that there is the obligation to be honest.

Hamilton is undoubtedly the most distinguished philosophical Realist of recent times. He has, deservedly, this repute from his learning, his energy, and his devotion to mental science. Physically and intellectually he was a man to draw admiration. His life was consecrated to philosophy. He had enriched his mind with the axioms and the sentiments of the greatest men of former ages, and with all those questions, so curious and subtle, which had occupied thinkers from the era of Plato and Aristotle, down through Roman and mediæval ages, to our own day. Far from being oppressed by a wealth imported from such various sources, his stores were so incorporated as to constitute the soul and substance of his mental being.

It is unfortunate, in some respects, that it was so; for we cannot help thinking that a much weaker, simpler, less endowed man, with half his amount of zeal, and with a tenth part his store of erudition, by pursuing carefully much humbler paths, might have further advanced that branch of philosophy which we are now considering. What Hamilton's writings, by following a more careful course, might have lost in temporary momentum

and grandeur, we feel assured they would have gained in instructiveness and precision.

Hamilton will ever be conspicuous as a man of extensive erudition on all subjects, and especially on Philosophy. But, as an actor on this field, we are disposed to think he will be more distinguished as a vigorous assailant of adverse opinions, than as a careful expositor of his own views. He is not, in any strict sense, a systematic writer. He is everywhere essentially and eminently combative. Imbued with the feeling of power, he exhibits ever the concomitant love of strenuous mental athletics,—eminently, in this respect, he is a Scotsman. His philosophical discussions, though everywhere enriched with a bewitching savour of antiquity, as became a disciple of Aristotle, are yet as thoroughly instinct with the energy and warmth of Polemics as if they had been forged in the days of Baxter and Owen. In ranging through the field of thought, it is invariably converted into the field of strife, and not only the maxims and doctrines, but the illustrious chiefs of past ages, are, by a stroke of his pen, summoned from their dust to overawe and to silence the

modern free-thinker. This is particularly the case when the theory of perception is discussed. Hamilton, here armed with the dogmas of Aristotle, steps forth the uncompromising champion of Realism—the upholder of the veracity of consciousness—the determined enemy of Brown and all his illustrious school: determined, at any cost, to cause the flag of Reid to wave over the slaughtered theories of all impious doubters and disbelievers,—yet not, be it observed, Reid's identical flag, but Reid's flag with a difference, as heraldry expresses it.

In the heat of this battle, it is not astonishing that he should have frequently overstepped his own views—taking up positions which he could not defend, and using language which he was by and by to retract, or explain away. This has rendered it extremely difficult to apprehend his exact opinions; and few men of what has been foolishly called the common-sense school have, from this cause, in spite of a thorough command of racy and vigorous language, exposed themselves to more frequent thrusts of adverse criticism than Hamilton.

To the ordinary reader, he seems to regard perception in the common-sense light—even as Reid did, or occasionally seemed to do—that we see the sun, that we feel the table, that we smell the rose, and that we hear the pianoforte. His declarations are so strong and absolute, that it is almost impossible for the out-door public, on a perusal of ordinary carefulness, to avoid putting this construction on his language. And so, by common-sense men, his views are received and revered, as embodying a substantial theory of what is called common-sense, in opposition to the supposed dangerous and fanciful views of other philosophers.[1]

[1] In 1856, the writer—then a tyro in metaphysical reading—brought out a volume, "The Philosophy of the Senses." In this treatise, when commenting on Sir W. Hamilton's views, he was greatly puzzled by the manner in which his opinions as a Realist were expressed. The writer, like the generality, interpreted his views in their literality, as expressed in the text. In this erroneous interpretation he was confirmed by one of Hamilton's most intelligent and diligent students, whom he consulted in order to avoid error in handling views so startling and incredible as those apparently avowed. An examination of Hamilton's works, while preparing the present volume, has satisfied the writer that, with all his reverence for that earnest votary of philosophy, it is impossible to avoid discovering what cannot but prove misleading statements and contradictions in his writings on perception. In confirmation of these strictures, see J. S. Mill's "Examination," and J. H. Stirling's "Analysis" of Hamilton.

Hamilton, it is almost universally believed, avows a direct perception of external nature in opposition to Descartes, Arnauld, Clarke, Brown, and most other philosophers, who hold that the impressions from the outer world on our senses produce ideas—mental sensations—modifications, or affections of the mind—which mental states they consider to be the objects we are directly conscious of, and not the external material things themselves. Hamilton, in opposition to one and all of these views, declares that we have a direct intuition of matter. "The external reality itself," says he, "constitutes the immediate and only object of perception" ("Discussions," p. 59). "The natural reality is the object immediately known in perception" ("Lectures on Metaphysics," p. 279). "In the immediate cognition, the object in consciousness and the object in existence are the same" ("Lectures," p. 80). "That we cannot show forth how the mind is capable of knowing something different from itself, is no reason to doubt that it is so capable" ("Discussions," p. 63). "To perceive, to know, and to be conscious of a thing, are the same mental act. Consciousness and immediate

knowledge are terms universally convertible" ("Discussions," p. 51).

"Knowledge and existence are, then, only convertible when the reality is known in itself; and this constitutes an immediate presentative or intuitive cognition, rigorously so called." ("Discussions," p. 58).

Then, in support of the same view, but on the plea that we are bound to uphold the absolute veracity of consciousness,—"Consciousness," says he, "is to the philosopher what the Bible is to the theologian. Both are professedly revelations of Divine truth. If consciousness were, however, confessed to yield a lying evidence in one particular, it could not be adduced as a credible witness at all—*falsus in uno, falsus in omnibus*" ("Discussions," pp. 86-88).

The natural Realist is therefore bound to receive the facts of consciousness without cavil, or, as Hamilton expresses it,—"The facts of consciousness, the whole facts, and nothing but the facts" ("Discussions," p. 64). And he argues cogently, that as consciousness testifies to a direct perception of the outer world, so we are bound, on the score of common morality, to receive this as a true

and philosophic theory of perception. In fact, when he is on this point, one would imagine that the chief or *only* article in philosophy was an unreasoning and blind acceptance of the *dicta* of consciousness.

Hamilton gives us, in his "Lectures," an illustration of the nature of direct perception, as he understands it; and, it will be remarked, that his views are strikingly opposed to those of Reid and Stewart, though as a natural Realist, he professes to belong to the same school.

To show that this difference exists, he prefaces what he has to say by quoting an important passage from "Stewart's Philosophy of the Human Mind." In order that we may at once perceive the difference between these authors, and appreciate the difficulty of the subject, we shall transcribe both Stewart's statement and Hamilton's comments on it.

"To what, then," says Stewart, "does Reid's statement amount? Merely to this, that the mind is so formed that certain impressions produced on our organs of sense by external objects are followed by corresponding sensations; and that these sensations, which have no more resemblance

to the qualities of matter than the words of a language have to the things they denote, are followed by a perception of the existence and qualities of the bodies by which the impressions are made; that all the steps of this process are equally incomprehensible; and that, for anything we can prove to the contrary, the connexion between the sensation and the perception, as well as between the impression and the sensation, may be both arbitrary: that it is therefore by no means impossible that our sensations may be merely *the occasions* on which the corresponding perceptions are excited; and that, at any rate, the consideration of those sensations, which are attributes of mind, can throw no light on the manner in which we acquire our knowledge of the existence and qualities of body. From this view of the subject it follows that it is the external objects themselves, and not any species or images of these objects, that the mind perceives; and that although by the constitution of our nature certain sensations are rendered the constant antecedents of our perceptions, yet it is just as difficult to explain how our perceptions are obtained by their means, as it would

be upon the supposition that the mind were all at once inspired with them, without any concomitant sensations whatever" (Stewart's "Philosophy of the Human Mind," part i., chap. i.)

Hamilton truly remarks,—"This view virtually denies the existence of matter as an efficient cause, making the Deity the only efficient cause in perception." "What are called physical causes and effects," says he, "being antecedents and consequents, but not in virtue of any mutual and necessary dependence, the only efficient cause being God, who *on occasion* of the antecedent, which is called the physical cause, produces the consequent, which is called the physical effect; so in the case of perception, the cognition of the external object is not, or may not be, a consequence of the immediate and natural relation of that object to the mind, but of the agency of God, who, as it were, reveals the outer existence to our perception."

"To this opinion," says Hamilton, "many objections occur. In the first place, so far is it from being, as Mr Stewart affirms, a plain statement of the fact, apart from all hypotheses,—it is manifestly hypothetical. In the second place, the hypothesis

assumes an occult principle. In the third place, the hypothesis is hyperphysical, calling in the proximate assistance of the Deity, while the necessity of such intervention is not established. In the fourth place, it goes even far to frustrate the whole doctrine of the two philosophers in regard to perception as a doctrine of intuition. For if God has bestowed on us the faculty of visionally perceiving the external object, there is no need to suppose the necessity of an immediate intervention of the Deity to make that act effectual."

Hamilton then proceeds to indicate his own opinions of perception thus:—

"Let us try, then, whether it be impossible, not to explain (for this it would be ridiculous to dream of attempting), but to render intelligible the possibility of an immediate perception of external objects, without assuming any of the three preceding hypotheses, *and without postulating aught that can be fairly refused.*

"Now, in the first place, there is no good ground to suppose that the mind is situated solely in the brain, or exclusively in any one part of the body. On the contrary, the supposition that it is really

present whenever we are conscious that it acts: in a word, the peripatetic aphorism—the soul is all in the whole, and all in every part—is more philosophical, and consequently more probable, than any other opinion. Admitting the spirituality of mind, all we know of the relation of soul and body is, that the former is connected with the latter in a way of which we are wholly ignorant; and that it holds relations different both in degree and kind with different parts of the organism. We have no right, however, to say that it is limited to any one part of the organism; for even if we admit that the nervous system is the part to which it is proximately united, still the nervous system is itself universally ramified throughout the body; and we have no more right to deny that the mind feels at the finger-points, as consciousness assures us, than to assert that it thinks exclusively in the brain. The sum of our knowledge of the connexion of mind and body is therefore this—that the united modifications[1] are dependent on certain corporal conditions; but of the nature of these conditions

[1] *Modification*, a word prized by Brown, but usually abhorred by Hamilton. Why is it used here?

we know nothing. For example, we know by experience that the mind perceives only through certain organs of sense, and that through these different organs it perceives in a different manner. But whether the senses be instruments, whether they be media,[1] or whether they be only partial outlets to the mind incarcerated in the body—on all this we can only theorize and conjecture. *We have no reason whatever to believe, contrary to the testimony of consciousness, that there is an action or affection of the bodily sense previous* to the mental perception; *or that the mind only perceives in the head, in consequence of the impression on the organ.* On the other hand, we have no reason whatever to doubt the report of consciousness, that we *actually perceive at the external point of sensation* and that *we perceive the material reality.* But what is meant by perceiving the material reality?

"In the first place, it does not mean that we perceive the material reality absolutely and in itself; that is, out of relation to our organs and faculties. On the contrary, the total and real object of per-

[1] *Media* is another dangerous word to be used by an author who abjures the idea of a mediate perception.

ception is the external object under relation to our sense and faculty of cognition. But though thus relative to us, the object is still no representation, no modification of the Ego. It is the non-Ego—the non-Ego modified and relative, it may be, but still the non-Ego. I formerly illustrated this to you by a supposition. Suppose that the total object of consciousness in perception is = 12; and suppose that the external reality contributes 6, the material sense 3, and the mind 3; this may enable you to form some rude conception of the nature of the object of perception" ("Lectures on Metaphysics," vol. ii., pp. 125–128).

Hamilton here throws aside all learned and technical language, and, in a much more simple manner than is his wont, explains his views of perception. But it strikes us he is, in the whole passage, in more respects than one, remarkably unfortunate. It is singular that Reid, in stating his theory of a direct perception, should have selected the sense of vision in illustration of his theory; a mistake which Hamilton, his friendly commentator, is compelled, in his "College Lectures," to correct—vision being a sense which gives us no direct, but

only a mediate representation of the external reality. It is scarcely less unfortunate that Hamilton, in the passage above quoted from his "Lectures," should have adduced, for illustration of his views, the sense of touch proper, and founded on the assumption that the mind feels at the finger-points; and it is equally singular that, after premising that he would not postulate *aught that could fairly be refused*, the first thing he does is to postulate what nearly all the world denied; it being all but universally held, at the time he wrote, by men of science, as well as by the vulgar, that the mind acts in the brain, and not at the outer organs of sense.

The correctness of the popular belief on this point has, since Hamilton wrote, been established; and the time which impulses made on the external organs take to travel from the different parts of the body to the brain where they are perceived has, by means of several varieties of highly ingenious instruments, been made the subject of measurement.[1]

[1] We are indebted for the discovery of this fact, so important both in physiology and in psychology, to experiments commenced by Professor Helmholtz in 1850, and prosecuted to the present time chiefly by Harles, Fick, Munk, Bezold, Pflüger, Dr Schelske, and

We can now state the number of feet per second, at which nervous impressions are transmitted along the nerves to the sensorium. And we may be allowed to say, in passing, that it pleases us to find that the percipient principle which we call the mind, resides in the nobler part of the body. For on the supposition of a belief in matter, the ascription of sensibility and consciousness to all parts of the body has something of a Sadducean cast about it; and we cannot but regard it as a heavy stroke to Materialism, that a proof has been found, that the body has no sensibility. Surgeons know that even the brain has none, or next to none, except under peculiar diseases or derangements. If the soul is to rule the body, we confess it seems to us more congruous that it should have its *special audience chamber in the head* where, seated alone in unapproachable mysteriousness, it receives its messages from the outer parts of its kingdom, and whence

Du Bois-Reymond of Berlin. By these experiments, the fact seems established that the transmission along the nerve of the external impulse, given in the organ of sense, is at the rate of 95 feet in a second, or less than the eleventh part the velocity with which sound passes through the air. (See lecture delivered at the Royal Institution, 13th April 1866, by Professor Emil du Bois-Reymond of Berlin.)

it issues forth its mandates, to the living and obedient microcosm, the body, saying to this part, Come, and it cometh, and to that part, Go, and it goeth.

If, then, the recent experiments alluded to are to be relied on, the theory of a direct perception at the finger-points, or at any other external organ of sense, must be abandoned, and with it all idea of a direct perception of external objects, in a true and literal sense.

In the second place, Hamilton's illustration is unfortunate, because the sense of touch proper, which is implied in the delicate sensations transmitted by these nerve-bespread extremities, the finger-points, gives us a very imperfect apprehension of a material or physical world—in fact, no apprehension at all. The physiologist might object to it that the apprehension is not direct, or immediate, for the external impulse travels along the nerve to the cephalic centre, where it is perceived, and that a sensible time occurs between the impulse and its manifestation in the brain. The disciple of Brown, or even of Reid and Stewart, might also say,—The impulse at the finger-points

creates a mere sensation—a mental affection entirely arbitrary and meaningless; and surely, however perfectly we give objective significance to such a sensation, and project it outward, as being the result of an external cause, such a sensation can in no correctness be regarded as an intuition of the external cause producing it.

And lastly, the sensation of touch proper, without the application of pressure, could never give any man the impression of the world as a solid external reality.

If Hamilton's illustration, and theory of a direct perception, are thus worthless, are we to adopt (the word is used with deferential reluctance) the *ridiculous* assumption of Stewart, that an arbitrary sensation is first given, entirely unlike the object or cause, but yet by a miracle, this sensation enables us to have a direct perception of the object? Surely a very moderate amount of reflection might have helped this graceful and sensible writer, to a better explanation of the riddle than this.

Let us then endeavour to examine the matter for ourselves. That the sensations are entirely meaningless, and give us no knowledge of exter-

nality, we think is very far from being the case. In the first place, have they not the quality of duration? Do they not occupy longer or shorter intervals of time? And, secondly, do they not succeed one another, either singly or in groups? Are we not conscious of this? and is this consciousness not a knowledge of Time, and a knowledge of Number?

In the third place, have they not something of the quality of Space in them? Do they not declare —it may be vaguely, but still absolutely— *We are here*,—not in time only, but in space.

This is eminently the declaration of the sense of vision. Do the sensations of colour not say unmistakably, *We are here?* Does each limited coloured portion presented to the mind in vision not proclaim, *I am here, external to all my neighbours?* I am larger or smaller than this part or that part.

And if vision gives us a representation of space, which it is impossible to deny, may we not, from analogy, even if we had no other way of verifying the fact, conclude that touch also presents us with a perception of sensations external to each other.

That we now think we feel the whereabouts of the different bodily sensations, we admit is no absolute proof that the sense of touch gave us this perception at first. The knowledge, it may be argued, has been acquired by experience, and judgment, reviewing the evidences of the different senses. But that touch does, more or less distinctly, reveal to us that the sensations are extended, we must naturally conclude from the knowledge that the nervous system consists of threads diffused throughout the whole body, and especially ramified over the organs of sense; and from the knowledge that these threads, or fibres, all terminate in different compartments of the brain,—a definite space or area of the brain being thus excited by each external impulse. And if we suppose the mind, through the excitement of that organ, to be made conscious of sensations, it seems naturally to follow that it will be conscious of the quality of extension, or size, according to the extent of the portion of the organ which has been excited.

Though vision, then, gives us the nicest perception of form and space, we are fully justified in holding that the sense of touch, which acts through

the nerves of common sensibility, diffused over the body, must give us the same discrimination of space, though in an inferior degree.

That we at once distinguish a pain in the foot from a pain in the hand, no one doubts. We perceive two or more impressions made on different parts of the body at the same moment. This is a proof of externality in our sensations; but we have a stronger proof than this. Many years after a leg has been removed, it is not uncommon to experience sensations similar to those which were felt when the leg was a part of the body. This is a circumstance perfectly well known, and it goes to establish three important facts—first, that sensations are felt, not in the part affected, but in the brain; second, that physiological reasons exist in the nervous system, or in the brain, producing the sensation of externality and space; and third, that the impression of externality does not arise from the mind pervading the entire body, and directly taking cognizance of its states.

Thus, then, we have acquired, directly through our sensations, an idea of the two first elements of a physical world—Time and Space. But the

question occurs, have we acquired a knowledge of the outer world; and have we proved its existence? The third factor which we are about to name, we think establishes this important point.

The third step we make is towards the knowledge of resisting qualities in nature; and this completes our conceptions of the physical world. I move freely among the various phenomena around me in space. The Ego is here—the Ego is there among them; but when I come into *juxtaposition* with any of these coloured phenomena, I find it resists my will—the power of motion is at an end, the Ego remains fixed among a circle of unmoving phenomena.

This experiment of the living, moving being, repeated in different ways, and always attended with the same results, completes its knowledge of the great fact of a physical world,—namely, that it exists in time—occupies space, and resists my desire to move—in other words, has physical power.

To the lawyer, the merchant, the artisan, this may appear simply puerile, but the philosopher will perceive that it is a problem of mighty meaning. We know the existence of a physical world chiefly from finding that it resists our will.

The question, whether we perceive its primary qualities through the muscular sensations, we shall by and by discuss. But, in the meantime, we view our knowledge of the world as the result of an actual conflict of Will, and Animal life, with resisting external nature. The battle of the spiritual with the physical,—things subject to entirely different laws coming into collision,—the self-moving, self-willing, self-conscious being, encountering the unwilling, unmoving, unconscious entity.

This is a knowledge bought by experience, and too frequently by suffering. The first great lesson taught the conscious being, when it tries to assert its prerogative of animal life, is this one: that it is destined to struggle with the resisting forces of a world ruled by laws different from its own. And from the hour in which we are enveloped in our swathing bands and laid to the mother's breast, down to the time of surrender, when we are wrapped in our winding-sheet and enclosed in the breast of mother earth, this is the main employment and struggle of ninety-nine out of the hundred of our teeming human race.

We may remark here, that it seems to us curi-

ously inconsistent with the principles of his Realism, that Hamilton, in his "College Lectures," should deny that we have any perception of physical *power*, or physical resistance; and that he should prefer making us perceive matter by the finger-points rather than by the thews and muscles. We have frequently wondered whether it ever occurred to him, as it does to us, that if we have no perception of Physical Power, we can have no perception of a Physical World, the primary characteristics of which are its solidity, or power of resisting penetration and compression—its tenacity, or power of resisting disruption, and its weight,—or power of drawing towards the earth's surface. By denying the perception of physical force, in our opinion, he destroys not only his own theory of a direct perception of the world, but every possible theory of a real perception

We do not mean, in saying so, to declare here whether we perceive physical power directly or indirectly. We reserve this question to a later page; we only wish here to draw attention to the fact stated.

CHAPTER VII.

POWER: DO WE PERCEIVE IT, OR DO WE ONLY INFER ITS EXISTENCE?

OUR Dynamical Theory is founded on the assumption that Physical Power is discovered everywhere throughout the Physical Creation,—that it is the operation of a spiritual principle appearing in everything to which we have access, and that this operation of power is regulated and adjusted everywhere so as to work out the purposes of the physical world.

The great majority of Metaphysical and Mental Philosophers either deny that physical power exists, or they deny that we obtain any perception of it, so as to prove its existence.

This is a serious matter in itself; and, if proved good, it is a formidable objection to the principles supported in this volume. We shall therefore devote the chapter following this to an exposition of

the grounds which lead us to believe that we have a direct perception of physical power; and in the present, we shall merely state the matter as viewed by Hamilton, who may be held here as the exponent of the views of many other philosophers; and we shall then examine the phenomena which accompany every putting forth of animal effort: and shall consider whether or not these phenomena are sufficient, without a direct perception of power, to lead us to the conclusion that we possess the species of power of which we speak.

Let us first briefly state the question.

The circumstance that our movements are *de facto* either resisted or entirely stopped by contact with external solid bodies, is not all that is embraced in our apprehension of the outer world. The element of Physical Power is deeply infused into all our conceptions of it.

Notwithstanding this universal impression and belief in the existence of Power, we find that Hume, Brown, Hamilton, Mill, Fraser, Mansel, and a large majority of philosophers, deny that we have any consciousness of its existence.

"It is now universally admitted," says Hamilton, "that we have no perception of the connexion of cause and effect in the external world. For example, when one billiard-ball is seen to strike another, we perceive only that the impulse of the one is followed by the motion of the other, but have no perception of any force or efficiency in the first by which it is connected with the second" ("Lectures," pp. 388–391).

Now, it may be at once admitted that the eye has no means of testing the existence of physical force; and it is this circumstance which Hamilton here refers to. If the hand, however, be applied to stop the moving ball, then the case is immediately altered, for we are at once impressed with the belief that we perceive power, and that it requires an effort on our part, to stop the motion of the ball, or of any other heavy body.

Such is the universal experience of mankind. Brown, indeed, seems an exception in this respect; for, so far as we understand him, he alleges that all that is perceived in any case, is the antecedent and the consequent—the moving ball, the hand interposed, and the ball at rest. He would appear entirely to overlook the vital accompaniments, viz.,

the mental and the physical feelings experienced during the putting forth of any animal effort.

Hamilton prosecutes the inquiry in this way,—"There are many philosophers who surrender the *external perception* (to wit, by the eye), and maintain our internal consciousness of causation or power."

This very careful statement of a self-evident distinction—viz., that the perception of power by vision is abandoned, while the doctrine of its perception by physical contact is still maintained by some—seems almost like a trifling with so important a question; because we can so easily make that which is external or only sensible to the eye —as motion—internal or sensible to the muscular system, by the simple act of laying hold of the moving body, and thereby experiencing the manifestation of power which we call a thrust or a pull, of which we are immediately made conscious.

We continue, however, the quotation, in which Hamilton thus states the arguments used by those who differ from himself on the question. "On this doctrine, *the notion of cause* is not given us by the observation of external phenomena, which,

as considered only by the senses, manifest no causal efficiency, and appear to us only as successive. But it is alleged to be given to us within—in reflexion, *in the consciousness of our operations*, and of the power which exerts them, viz., the will. I make an effort to move my arm, and I move it.

"This reasoning," says Hamilton, "in so far as regards the mere empirical fact of our consciousness of causality in the relation of our will as moving, and of our limbs as moved, is refuted by the consideration that between the overt fact of corporeal movement, of which we are cognisant, and of the internal act of mental determination, of which we are also cognisant, there intervenes a numerous series of intermediate agencies, of which we have no consciousness of any causal connexion, between the extreme links of the chain, the volition to move and the limb moving. As the hypothesis asserts, no one is immediately conscious, for example, of moving his arm through his volition. Previously to this ultimate movement, muscles, nerves, a multitude of solid and fluid parts, must be set in motion by the will; but of this motion we know from consciousness actually

nothing" ("Lectures on Metaphysics," pp. 390-392).

Now, in the outset, and before we touch on the actual phenomena witnessed during muscular exertion, or allude to the physical steps involved in the process, we cannot avoid expressing our amazement that Hamilton, who holds so strongly that we perceive objects directly by the organs excited by them, should, either wittingly or unwittingly, without one expression of regret, abandon his favourite theory of a direct perception, and deny that we perceive *power* by the muscles when excited by physical effort.

That he should have maintained that by the senses we perceive the ultimate source of power, it would have been wrong for us to expect; but that he should affirm that the senses give us a direct perception of the table, and should deny that they give us a perception of its weight, or its hardness, which are manifestations of power—this, we confess, excites our liveliest surprise. That we directly perceive physical objects, he dogmatically insists; but that we perceive those primary qualities by which physical objects are specially distinguished, he as positively denies. In so doing, if we understand him at all, he most effectually overthrows his own theory of perception, and every possible theory of Realism.

In the passage just quoted, Hamilton virtually denies that we are conscious of the weight or hardness of the table, or of the momentum of a moving body, because between the will to move the limb, or to press the table with the hand, and the act of doing so, there intervenes a numerous series of intermediate agencies; and because we have no knowledge of any causal connexion between the extreme links of the chain. Is it not exceedingly clear that if, as he assumes, the mind pervades the whole body, it should perceive the *weight* and *hardness* of the table, and the *impulse* of the billiard-ball, *in the muscle*, in the same way that it perceives the *existence* of these bodies at the *finger-points?* And if, on the contrary, the mind resides in the brain, is his objection that we have no consciousness of these qualities of hardness, weight, and momentum, because we have no consciousness of the intermediate agencies existing between the muscle and the mind,—not

equally valid, in regard to our perceiving objects at all?

It is quite true that we have no inner consciousness of the physical operations involved in the production of muscular motion. But this is no practical bar to our establishing the connexion which subsists between these insensible agencies. Fortunately, by scientific investigation, we can lay open the hidden steps of the process, and can thus form something like an intelligent theory of their connexion and modes of action; and this circumstance is not to be ignored by any philosopher, whether physical or metaphysical.

In illustration of our meaning: when a piece of fresh muscle is made a part of a galvanic current, it immediately contracts; and we are justified in holding that, on somewhat the same principle, the muscles of the living body contract in voluntary movement, under the influence of the nervous agent, which is subject to our mental control, and which, till we get more light, we may assume to be analogous in its nature with the electric or galvanic agent. These motions or contractions of the dead and of the living muscle are in obedience to

a law of Nature, the ultimate cause of which we can only ascribe to the Supreme Being. Still, the observance of so curious a law is important, and, if studied, it may lead us on to further psychological discovery: it is therefore not to be neglected.

By our senses, then, we are enabled to follow the links of the chain in voluntary movement. They are three in number: first, the act or effort of will; second, the action of the nervous current; and third, the contraction of the muscle. When we are endeavouring to solve a difficult problem, it is highly important that we endeavour to simplify and not to complicate the question to be solved; and we regret to find that mental philosophers are occasionally neglectful of this most useful rule; for, in so far as a physicist may understand a steam-engine, or any other machine, nearly to the same extent may he hope to acquire a knowledge of the workings of the combined mental and animal organism; and as we speak of the heat and of the steam, and the mysterious principle of power by them evolved, and, at the same time, of the arrangement of the mechanical parts of the artificial machine,—even so,

as philosophers, may we, with reference to the operations of animal movement, talk of the will, of the nervous medium, and of the muscles.

This knowledge, however, so important for an engineer and physiologist, is not, it may be said, sufficient to satisfy the deeper searchings of the mental philosopher, and this we freely admit. Let the metaphysician analyze as carefully as he can; but let him not neglect the discoveries of science, as if no assistance could come from them. Let him never turn with indifference from the physical accompaniments of mental and animal action; because assuredly He who made the mind, made also the body; and we believe it will never be found possible to explain the operation of the one without an intelligent knowledge of the operations of the other. We hope we may, in the next chapter, succeed in making the truth of this assertion more evident, at least to such as are not prejudiced against allying physical inquiry with mental philosophy.

In the meantime, we may approach the vexed subject of *cause* and *effect*, and consider the question involved in it, viz.,—Have we any perception of

Power—of that occult principle which alone makes the words, Cause and Effect, have any meaning or significance?

We all *believe* in the connexion of cause and effect. If it be so, we may well join with the bulk of common-sense men in asking, How comes this belief to be a law of our intellectual nature if there be no foundation for it in our experience? Would we believe in the connexion of cause and effect unless we perceived that there were power in the cause to produce the effect? Would the mere fact of invariable sequence, produce in us this our strongest and most persistent judgment,—namely, that it is Power which affects all physical changes? We cannot for one moment believe it.

If our causal judgment were built upon the foundation of mere antecedent and consequent, it might indeed be called an instinct, but it could never be properly termed a judgment; for it would have no foundation in reason. We moreover doubt exceedingly whether a bare unvarying sequence—such as we might perceive by vision—would ever evoke in us anything like the causal judgment which we so unequivocally pronounce

whenever we see or hear of the occurrence of any event.

It is evident that this judgment must either arise from the fact that we perceive power, as the connecting link between cause and effect,—or it must be a judgment or inference founded on mere circumstantial evidence, the value of which, as in the case of all indirect or circumstantial evidence, is not absolute and conclusive. Or, lastly, it must be an unreasoning instinct, which may be true or may be false. Which of these, we ask, is the most probable supposition? We declare for the existence of a distinct judgment founded on consciousness; and we hold that what is called the causal judgment is a generalization of the facts which are given us by experience.

We hear a great deal about what is called the causal judgment, and it has been explained as that principle which compels us to believe that *every event must have a cause.* Now, what is meant by every event? Evidently it means nothing. We cannot form any such abstract idea as, every event. If we think at all, we must think regarding something—some concrete thing or event.

And even if we imagine an event or thing, the imagination must be formed of materials borrowed from the records of our experience. Suppose that the event were one of which we could have no possible experience, in this case we might perhaps refuse to think about it at all; but if we did consider the question, would we not of necessity class the event under some one of the known phenomena, physical or mental, of which we had previous knowledge? and would we not account for it by some one or other known physical or mental law?

Suppose, for instance, the event were the passage of an angel from one locality to another. It is perfectly evident that, in endeavouring to account for such an event, we would either clothe the angel with somewhat of a physical nature, and explain his flight on some physical principle; or we would represent him as free from physical laws (a very difficult, perhaps impossible conception), and imagine an act of volition sufficient to produce the result. Our belief in a cause for every imaginable event must therefore, we believe, have its origin—not from a blind instinct—but from the fact that we perceive power as the cause of every event we

examine, and from generalizing and applying the facts of this experience.

Far be it from us, in saying so, to countenance the idea that this judgment has not its root in a deep instinct of reason. We hold that it is only by an instinct of our intelligence that we predicate power as an operative principle in external nature; and that the mind, along with this perception, should form the causal judgment, we regard just as a further evidence of its being endowed with reason. For we must never cease to remember that intelligence is allied to the Divine nature, from which it has its source.

Perhaps there might be another way of coming to a vague and meaningless belief in the operation of cause and effect, irrespective of the direct perception of power; but the conclusion would be very different in its nature from what man and all animals experience. Let us examine the phenomena which accompany animal effort, and see whether or not we might be led by them to form this causal judgment.

There are four things observable when we perform any physical work,—*first*, the volition, or

desire and effort of the mind to bring the limbs into action; *second*, the perception of a peculiar sensation in the muscles employed in the work; *third*, a perception that the muscles exerted are shortened—*i.e.*, that the parts are drawn closer together, sometimes to such an extent that they appear as hard and condensed as wood; *fourthly*, the perception that the external work is accomplished—the stone is lifted. During the performance of the work, we must remark, there is a continued Mental Effort.

Now, we always observe these peculiar features in connexion with animal exertion: viz., that the intensity of the *mental effort*—the amount or strength of the *muscular sensations*—and the *quantity of work done*, are proportioned to each other. Thus, a feeble effort of will produces, *cæteris paribus*, feeble *sensations* and a small *physical result;* a more strenuous mental volition, produces stronger muscular sensations, and a greater material result. When a large amount of work is to be effected, the Mental Effort is often violent and sometimes painful and distressing; and so are the corporeal sensations which accompany it. And if the

efforts are long continued, they are generally succeeded by exhaustion both of mind and body. Nothing is so certain as that an animal can only accomplish a certain quantum of work. The absolute amount at any time, however, depends on the condition of the animal frame at the time.

It is not, however, the want of will, but the want of mental vigour, and of physical power, that brings our exertions to a stop. Just as a watch stands still when the mainspring has run out, or as a steam-engine stops when the coal or the steam fails; in like manner, the animal machine loses its power of working, when the nervous influence generated in the body is expended, or when the muscular fibres are exhausted and attenuated by disease, or by previous over-exertion, or by lack of the necessary nutriment.

When we feel our muscular efforts to be easily accomplished, and rather to be a pleasure than otherwise, we call the feeling a consciousness of latent power and strength. This is a knowledge acquired from the experience that the body, when conscious of certain sensations, will be able to discharge its part efficiently. It is positively irksome for a young person to remain inactive; the circulation of the blood is so quick, and the nervous supply is so superabundant, that there is a painful sense of muscular irritability experienced, and the only way of getting relief, is to use up the surplus quantity by violent bodily movements.

Here, then, we have abundance of phenomena accompanying, and following the act of volition. Is the belief that we possess power the result of a judgment passed on any one of these phenomena, or is it a judgment passed on the whole phenomena taken together? and if so, which of them is the *sine qua non* in forming and moulding our belief in the existence of physical power as the operative principle?

That *de facto* we possess the ability or power to move, can scarcely be doubted. The word ability or power, however, is sometimes conventionally made to signify simply that when we wish to move, we move. Such an ability we may conceive, for instance, to be possessed by a paralytic, provided he had a party ready and willing, at any moment, to move him, when he signified his desire by a word or nod. Such an ability or power, however,

as it does not imply the possession of physical power on the part of the paralytic, is evidently not that feeling or principle which we are conscious of when we exert our physical frame by an act of mental effort, and regarding which we are inquiring.

Viewing power, therefore, in the meantime, in the restricted light of an *ability to obtain motion*, and assuming, for argument's sake, that there were no consciousness of mental effort accompanying the simple act of volition. Suppose, for instance, that we saw the motion of the body invariably follow the simple act of volition, unaccompanied by mental effort, and without our discovering any agent to account for it,—is it possible or likely that we would conclude that we possessed the ability, in some way unknown, of moving? We think we might form this conclusion. And especially when we took into account the fact of the muscular sensations being graduated in intensity according to the amount of the work performed, we think it very probable that we might, from these data, come to form the judgment that we were real agents in doing the work. But we could have no conception of what

the nature of physical work was; we would have no apprehension of what we are in search of—that element which we call Physical Power.

Let us see what assistance the muscular sensations might give us towards making such a discovery. When we have no corporeal sensations, we cannot be said to be conscious of possessing a physical body at all. The more action and sensation we experience, the more are we conscious of animal life, and of corporeal existence. By the sensations experienced when we are engaged in healthful exercise, we are so constituted as to feel as if the mind and the body, as sentient, are one connected whole—we feel not only as if we had in the body an obedient servant, but as if it were the body and the mind together, which constituted the *Ego*. The conception, we admit, may be formed of an animal enjoying all these emotions and sensations, even irrespective of, and without the consciousness of an exercise of mental power to originate them: and as these sensations followed the simple act of will (without the element of power or effort in it), the animal might form the judgment that it was in some way or other

not a sham, but a real agent in bringing them about.

This conclusion or judgment would even receive a certain amount of distinctness from the peculiar and varying bodily sensations which accompanied the movements. But, we ask, would the judgment not be entirely incomplete, and quite unlike what we experience, unless the animal had, over and above all the phenomena named, the perception or consciousness that it was exerting a direct mental effort, and was thus the intelligent producer of the physical effects observed? Without this perception of mental effort, all the actions of animal life would be quite meaningless, empty, and unsatisfactory—entirely unsuited to the requirements of animal existence and enjoyment. Animal existence ever demands a free exercise of will, and a full employment of its powers. It is the direct feeling of physical and mental power which constitutes the chief happiness both of man and of the lower animals, especially during youth, when physical effort and the lusty strain of the limbs are the natural and befitting employment. It is the consciousness of physical difficulties overcome

by the strenuous exercise of Will, that constitutes their triumph; and it is this exercise of Will and Mental Effort, applied in effecting bodily movements, which, both in youth and in manhood, constitutes the element we are in search of—namely, Physical Power. The *sine qua non* therefore, in giving us the sense of power, is *the consciousness of Mental Effort.*

CHAPTER VIII.

THE DIRECT PERCEPTION OF POWER—THE MIND POSSESSES POWER, EXERTS POWER, AND PERCEIVES POWER, PHYSICAL AND MENTAL.

SUCH reflections on the phenomena of animal life, with the view of discovering how the mind may be supposed to form a judgment regarding the existence of an external world such as ours, and regarding ourselves as real and not sham agents in it, are doubtless important; but the question relating to the precise nature of the faculty of perception, and especially regarding the direct perception of power, we consider as still more important—in fact, as the most curious and important question which can engage the philosophical attention. And this, more especially, since we find that mental philosophers are nearly all agreed that man has *no perception of physical power*.

If we were to prefix a motto to the present

chapter, it would be this—That the Mind Perceives Directly all its Powers, and all its Sensations or Affections.

We cannot say this of the liver or of the heart, or of other equally important internal organs; but with regard to the Intellectual Principle, we state the proposition broadly and absolutely. We regard it as so evidently true, that it is a truism. And yet we find that mental philosophers have disputed it; for, so far as we can understand their language, they deny that man has any consciousness of Physical Power.

We confess we regret exceedingly that able men, in the prosecution of knowledge, should find themselves thus ranged in opposition to the natural convictions of mankind. Our regret is not assumed. We feel it painful that philosophy should have led the mind into a position entirely opposed to the natural belief of the human race: and therefore we venture, in the face of all the learned authority against us, to make one more appeal, at once to philosophy and to common sense. After what we have said in previous chapters, a few pages, we hope, may suffice to explain all we can state, as

the grounds of our very opposite convictions on this curious subject.

We preface our observations by asking, Has it not the aspect of being manifestly absurd to deny what all the world believes? We, and all men, are convinced that physical power in external objects is just that which enables us to perceive the world. The qualities of substances are admitted to be what excite our senses; and what, we ask, are these qualities but the manifestations to us, of the active principles or powers which physical objects possess?

We cannot conceive any outward object, or substance to affect our bodily senses, except in so far as it possesses the power to do so. The perception of an object is thus just the perception of its various powers manifested to us through the different organs of sense; and without such power to affect our physical organs, the objects could not be perceived by us at all.

The position, therefore, taken up by metaphysical writers, that we have no perception of physical power, is a very unaccountable one, and cannot fail to prove very bewildering to ordinary men.

When I hold a heavy body in my hand I have, using the unvarying language of mankind, the feeling and belief that it is heavy, or is pulled downwards. When I arrest the progress of a moving body, as, for example, a billiard-ball, I have a similar feeling that I perceive force. When I press against a wall, I find that it has resisting power.

The power in these instances, we admit, is not directly perceived, as it exists in the external objects. The mind does not go out of itself to obtain an intuition of the action of external bodies. No! we perceive *mediately* or *indirectly that they have power*, by perceiving directly *that we have it ourselves*. The opposing force which is in them we estimate by the amount of power which we are conscious of exerting in opposing them through our compound mental, and physical, organism.

Is this perception of our power, we ask, a deception, or is it a reality? The philosophy of materialistic Realism declares that we perceive matter and an external world by the senses; but it denies that we perceive power. It argues thus:—How can we perceive power, a thing or a principle of

whose nature we know nothing; a thing occult, and necessarily unknowable; a thing which, not being material, is not accessible to the senses?

What! is it a just assumption for a mental philosopher to make, that the mind, which is itself a spiritual principle, can have no cognition of an immaterial spiritual action? We should have thought that the reverse of this would have been the more just and natural conclusion; and yet this is the objection used by mental philosophers.

Power, it is maintained, we cannot *know;* we may, from perceiving the existence of certain physical results, infer it, if we choose; but we cannot expect to know it, or perceive it.

The sensation I experience when I hold the heavy body in my hand, or when I stop the rolling ball, is, say they, not a sensation of physical power; it is either a sensation entirely meaningless, or it is, at best, a consciousness of the *effects* of that physical power which I infer to exist as its cause.

This assertion, in so far as regards the muscular sensations, we do not mean to dispute. We think with regard to these, the assertion is correct; but, at the same time, it seems clear that in thus referring to the muscular sensations, when in search of power, these parties evince that they are inquiring after it in a wrong direction.

We agree with them that we cannot acquire a knowledge of power in these sensations. We hold that it is to be found directly only where it resides, namely—in the mind—where it exerts the mysterious and effectual act of volition. When it exerts this faculty effectually, we are conscious of the effectual exercise of power.

Hamilton, who believed that our sensations give us a direct perception of the physical world, lay under peculiar obligations to hold, that the muscular sensations which accompany animal effort, give us a perception of physical power; yet, strange to say, he denies that they do so. Virtually, according to his theory, we perceive the table directly at the finger points, by the sensations there felt; but we do not perceive the weight of the table, or its solidity, by the muscular sensations. Philosophy is surely by such contradictions brought into a very disreputable state of confusion.

When holding the theory of a dynamical world, we are led into no such contradictions; and the

difficulty which probably confronted Hamilton, Brown, and other philosophers, disappears; for—if the world is a manifestation of Divine power, acting according to physical law—when we perceive an object, we perceive at once the object and the immaterial cause. We do not require to say that the power is the occult cause of the object, and of its qualities, or that the object is the result of the power, but the one and the other are the same,—*the power is the object;* and in perceiving the object we perceive the power. If this view is correct, there exists neither room nor necessity for the paradox, which metaphysicians are not ashamed to admit into their philosophy, namely—that we perceive the physical object, but do not perceive any of its powers or properties; and the equally unsatisfactory position, that we believe in power, but are not conscious of it. The dynamical theory infers, on the contrary, that in perceiving the primary qualities of an object, we perceive physical power.

Again, it has ever been an unsurmountable difficulty to comprehend, or even to believe, that matter should act on mind, or mind on matter. We have already attempted to explain, that in

connexion with our theory, no such difficulty occurs; for what reluctance can possibly be experienced in admitting, that principles of the selfsame spiritual immaterial nature should directly influence each other? What difficulty can we have in believing, that the world, which is a manifestation of Divine power (and therefore spiritual in its nature, though exhibiting itself to us according to physical law), may thus be perceived by the spiritual principle which man and other animals possess.

When we say we perceive physical power, let us not be misunderstood. We do not directly perceive its Divine or ultimate cause. We perceive this, it is true, but we perceive it only under its physical manifestations. We only feel external power in so far as it meets, and manifests itself to the spiritual principle which we possess, and in so far as it opposes and limits our will; but *we know power directly*, as it exists within ourselves; and we are enabled to declare it to be the operation within us of a spiritual endowment or principle. It is a mental endowment, and therefore we are directly conscious of it.

This view of a subject, long held so difficult, we think is worthy of consideration, if it were for no other reason, than that by it our natural and our philosophical beliefs are reconciled, and a consistency is established which we have not discovered in any previous system of Realism.

If we are called to explain more precisely the extent of this our knowledge of Power, and how we acquire it, we readily comply with the request. In order that we may do so, let us recur to the physical steps which precede and accompany the act of perception; we thus narrow the field, and by availing ourselves fully of the parts of the process which we know, we are in a more favourable position for judging aright, regarding the part that is considered unseen and unknown.

And, first, as to the muscular sensations, and along with them we may be allowed a word regarding all sensations; for the nature of animal sensation is generally but imperfectly apprehended.

When my arm is employed in the act of raising a heavy weight, there is physical power in the violently contracted muscle of that limb. Its parts are powerfully drawn together.

The sensitive nerves with which the muscle is furnished, are at the same time excited to action by the muscular contractions, and this action is by them propagated to the appropriate portion of the brain. The action upon the brain thus serves as an indication of the abnormal condition of the muscle. This nervous action the mind recognises as muscular sensation. We have come by association to regard these muscular sensations as sensations of power, of strain, of effort. But this seems just another instance how naturally we take the sign for the thing signified; for we think that in the sensation itself we discover nothing informing us of power exerted in the limb.

What the sensation seems to contain and to communicate is merely a peculiar feeling, as if situated in the muscle; and this sensation is most useful, as it serves by its varying intensity to be an appropriate index of the amount of action in the muscle at the time. If the muscular effort be violent, the sensation is increased, and is largely mixed with pain, or a feeling of distress; and we judge that with a little more effort, the machine would fail, and a disruption or injury to the part, or to the brain, would ensue.

Examining as closely as we can, and judging as honestly as we can, we cannot, however, discover that these peculiar muscular sensations communicate to the mind the knowledge of power. They, and all other sensations, are well and wisely suited for the ends they respectively subserve; but many of them we shall find are quite arbitrary. We have called them animal sensations, because all that they primarily indicate is, that the animal frame is somewhere and somehow affected. Without an exercise of judgment they teach us nothing beyond this. The sensations produced in us by the secondary qualities of objects are purely arbitrary — such as taste, smell, hearing, colour, heat, cold, etc. These are subjective, and inform us of nothing external which correspond with themselves. As regards the sensations produced by the primary qualities of physical bodies, it is different. These contain within them a representation of size and form, and thus they instruct us in the elementary lesson of external physical reality.

We do not, as we have said, find that the muscular sensations, if we separate them carefully from judgments by habit associated with them, contain

any representation of physical power. No amount of strain or of injury to the muscle by pressure, or by external force of any kind, would cause them to contain this element, of power, or force.

If the mind does not perceive power through the muscular sensations, neither does it perceive the nature of the Nervous Action or Movement transmitted from the excited muscle. It is, indeed, entirely unconscious of its existence. Surely, then, we may remark, as regards the muscular and all other sensations, that it is much more correct to say that the mind is affected, or influenced, or in some way modified by the action of the nervous agent, than that it *perceives* that action. All that it perceives are its own affections or sensations.

Sensation, be it observed, is not a voluntary act: on the contrary, the mind cannot escape from the affection which we call a sensation. When a severe external pressure or strain is applied to a limb, the mind is thrown into a state of pain which it cannot banish by any voluntary act. It would seem, then, there is some correctness in the form of expression we formerly used when we said that, to

a certain extent, the mind—besides its power of voluntary action and thought—appears as if also amenable to physical impression, or to the influence of certain physical laws. But it is evident that, according to our theory, this implies no more than that, in its susceptibility to the impressions of physical movements, it is susceptible to the spiritual agent which, by and through these movements, acts on it.

If, then, the muscular sensations do not inform us of physical power, but only help to indicate its amount after we know its existence, we can have no difficulty or hesitation in declaring where we acquire our knowledge of power.

We have already said, and we here repeat it, that we are informed of power by the mind, the undoubted possessor of it. When the mind, as an active operative principle, exerts its voluntary powers, we are then necessarily conscious of Power. Of this the reader will be convinced if he takes the trouble to follow us in the examination we have commenced.

If the nervous impulse from the excited muscle has permeated the brain, and produced in the mind

the affection which we call a muscular sensation, the mind, on the other hand, through the power with which it has, for that very object, been endowed, exerts the faculty it possesses, and generates free physical force in its special organ, in the way we shall immediately explain, and sends it forth on its mission through the appropriate nerves towards the muscle, and thus makes the action of that organ effectual in overcoming the external force or weight which may be opposed to it.

If the weight is considerable, a strong mental effort is employed; if the weight is less considerable, a less mental effort suffices, and a less eflux of free cerebral power is required. The mind is here, it will be seen, a real agent, in producing and in directing the action of physical force; and it has a perfect consciousness of itself in this relation: in other words, it directly perceives, or is conscious of its own power: and through the amount of power or successful effort which itself is conscious of exerting, it estimates the external opposing power which it encounters. This external opposing power, which exists in dynamical equipoise alike in the nervous medium, in the muscle, and in the

external heavy body (or which, at least, has a quantitive relation in them all), is, as we have repeatedly explained, the action of the spiritual principle of force which rules throughout Nature; and the power which the mind exerts in conducting the animal effort is the action of that same spiritual principle of force with which itself is specially endowed for the exercise of its physical functions.

Hamilton argues that we have, in the efforts alluded to, no consciousness of power; because, if the nerve be paralyzed, we put forth the act of will, but no physical result follows. Therefore, argues he, in the act of will there is no consciousness of operative power. We ask, why is it so in the case supposed? For the very simple reason that there is no external operative power exerted. External operative power only manifests itself where it exists; and it can only exist, and be felt, when it is exerting itself. In the instance supposed, the physical chain which connects the act of will with the muscle, and through it with the external resisting object is sundered or impaired; and, as a necessary consequence, neither the nervous agent nor the

muscular force are brought into action, or into opposition with the external object to be raised.

If I am drawing a weight along by a string, I am conscious of exerting power. If the string snaps, I instantly cease to exert force, and, of course, I instantly cease to be conscious of force; though I may be conscious of the will to draw the stone.

The subject is undoubtedly a difficult one. Let us endeavour to deal with it dispassionately. In the case of paralysis of the nerve, or in the case of the nerve being suddenly severed, or compressed, we do not mean to assert that the mental effort may not be made. We think it may—we think even a violent effort may be made. But the effort will be a very brief one. It is not followed by the usual sensational accompaniments of successful physical action, and the mental effort will therefore instantly cease. It seems a law of animal nature—a very marked instinct—that immediately we are conscious of a serious injury to an organ, or a total obstruction to its action, we as immediately shrink from all attempted action of that organ.

In all healthy and successful physical exertion, the amount of mental effort is in strict proportion to the physical work which is being done; and when the work goes on, we are conscious of the power we are continuously exerting; but when we are made conscious of total incapacity from physical injury to the organ through which power is exerted, the mental effort at once ceases.

Let us suppose, however, that notwithstanding the injury to the motor nerve, the mind were to continue its accustomed efforts; in this case, the channel being closed, there would be no efflux of force through the nerve, and the action of the brain would consequently, and we may suppose of necessity, cease. We do not deny that the mind may, even in these circumstances, have the power of continuing its efforts; but, at the same time, it is evident that the mind in such circumstances would be painfully conscious of its power not being effectual. A man who is bound hand and foot may exert physical power, or a man buried in a sand-pit may exert physical power, but it is entirely ineffectual; he cannot move a finger or a limb; and yet he is conscious of exerting

his utmost power; and so, we think, may it be with the mind in the case of paralysis of the nerve. It may be conscious of *exerting power*, but it is equally conscious that its efforts have no external efficiency, owing to the injury to the link which connects the internal with the external.

CHAPTER IX.

THE PHYSICAL POWERS OF THE MIND

THAT the world is governed by Power is a religious truth. It is also a physical fact, and one of the most curious which science has yet attempted to develop. The subject of Power or Force has been, in our day, investigated with more ardour and success than almost any branch of natural science; and the votaries of pure physics —such men as Faraday, Helmholtz, Mayer, Liebig, Thompson, Grove, and others too numerous to name—have been led by it out of their own field into a region where experimental investigation, instead of excluding, rather solicits the help of metaphysical thought. Such a result is inevitable when we come to consider the subject of Power, which is necessarily viewed not as a substance, but as an influence, or an action. The

metaphysician must not recoil from this invasion of his province: rather let him hail the fact that a point of contact has been established between phenomena which have hitherto been considered as destined to remain for ever apart.

It need not surprise us, that the subject of physical power should very readily lay hold of the imagination, when we have once reflected on the nature of this principle. But so soon as we realize the fact, that Power may be contemplated not merely as an abstract idea, but as an action which may be traced step by step throughout Nature,—that it may on the one hand be made to submit itself to scientific manipulation, while, on the other hand, it invites the metaphysical mind to ponder the nature of its existence, as the physical yet immaterial copula which binds together cause and effect,—we say, when these new and startling aspects of the subject are considered, it is impossible to avoid the conclusion that a very great expansion of our views upon the physical constitution of the world must thereby be brought about, and that much of that difficulty which has

hitherto encompassed philosophy will thereby be removed.

In a volume on the World as Dynamical, it might be expected that we would largely avail ourselves of the new science of Force. This, however, is not our intention. It would fill our pages with difficult and imperfectly digested matter, and would lead us into a too extensive and intricate labyrinth of thought.

The subject is one, the importance of which we cannot too highly estimate. Its principles are, however, as yet far from being fully and clearly established; and the writer regrets it is one which he has not in any adequate measure made a subject of study.

Some of the leading opinions or surmises, so far as we can gather them, we may however, state, throwing ourselves on the indulgence of the better instructed reader in case of his discovering any misapprehension or unintentional errors in our exposition.

Every change in mass, and every change in the chemical constitution of bodies, is effected by power; heat, light, electricity, magnetism, gravity,

chemical affinities—all these different manifestations may be regarded as in whole or in part, convertible the one into the other, and in every case we may best explain them, not as separate entities, but as varying exhibitions of that principle or action which we call Power.

Physicists are led to believe from the laws which they observe, that there is a definite amount of power which conducts the operations of the physical universe. The writer of this volume, in conformity with his theory, expresses the fact somewhat differently, though the result is the same, namely, that the physical universe is a manifestation of power, working according to physical law, both as regards amount, and mode of action.

Physical power, in the world, is subject, so far as we have experience, neither to augmentation nor diminution.

Physical power, in all physical operations, may be transferred from one object to another, but it is never lost.

We may regard physical power as an immaterial or spiritual agent, or we may consider it merely as a mode of action; but, as its name

implies, the action of physical power is always subject to what is called physical law.

Here then, apparently, is that occult principle which has always been believed in by mankind when following their natural instincts, and the teaching of the senses. Here is power, which has always been disallowed and slighted by metaphysicians as a crotchet of superstition, tabled and brought before the public for a scientific and searching examination; and we are invited to pronounce a judgment upon it, and to settle and declare its nature.

Its measure is alleged to be the measure of all the physical changes which occur in the world. It is a One Power, though, Proteus like, it exhibits itself under a thousand shifting guises. At one moment it is dissolving metals in water—at another moment, that which was overmastering the cohesion of iron or zinc is, at our option, passing through wires, and dissipating the most obdurate materials, with the accompaniment of brilliant corruscations of light. Anon, that we may satisfy ourselves that this invisible and immaterial power is the same and unchanged, we wrap the

wire round a heavy bar of iron, and the power which was tearing the particles of iron asunder exhibits itself in that form with which we are most familiar—namely, as Mechanical Force. It converts the iron bar instantly into a powerful magnet, capable of sustaining, it may be, many tons weight.

Let us now consider those manifestations of power which will lead us to understand what is called Animal Force, with which our subject is more immediately connected.

All solid bodies, whether simple or compound, are bound together in mass by that force which we usually call the power of cohesion. In the case of compound bodies, the elements are bound together by the power which we call chemical attraction.

When mechanical force is employed to overcome the cohesion of solid bodies, there is, it is supposed, the liberation of a certain quantity of the force which bound their parts together. We have evidence of this in a flash of light, when we break a piece of loaf sugar and grind the pieces together in the dark; and we observe it still better when we disintegrate the substance of two pieces of white quartz by rubbing the one against the other.

When, instead of mechanical force, we employ chemical agents to dissolve simple or compound bodies, the result is the same. There is a disturbance of the dynamical equilibrium, and either a certain amount of free force is liberated, or there is a vacuum of power produced; and the necessity for an equipoise is exhibited to us, in that transfer of power, which we have been in the habit of calling electrical or galvanic action.

In the decomposition of animal and vegetable compounds, and of organic bodies, the same phenomena are presented, and a balance of free force shows itself in the transfer of force to or from the body decomposed.

This free force may, in many cases, by the use of appropriate contrivances, be brought fully under our control, and be made available for the production of heat, light, and mechanical work.

It can be sent through wires, and made to exhibit the various phenomena which accompany what are called electricity and magnetism. As heat, this imponderable power can be sent into water, when the mechanical movements, which would otherwise be radiated into space and lost, are ex-

pended on this ponderous atomic substance, which its vibratory movements beat into parts so small as to be invisible; and, fortunately, we can conduct the power—and the steam, with which it is in close connexion—in any direction we wish. The power set free by the decomposition of the coal, and the motion generated by the force of the new combinations which result, are thus utilized by man, and they become the staple of our national wealth, and our national power.

The sparks which pass between the points of an interrupted electrical circuit, are not exhibitions of a separate principle called electricity. They are the mere results of physical force in rapid passage between the points. Flame is the exhibition of power obtained by chemical combination, and which, in its movement, shakes the elastic ethereal medium with which all things are encompassed.

As the world is governed by the operations of force, power, though a spiritual act, is necessarily subjected to law. It is thus alone that we could have a world such as ours suited to the purposes of animal and vegetable life. It is because power is directed by intelligence that it is available for

the uses of intelligent beings; and it is because we are intelligent beings that it is put, to a certain extent, under the control of our will.

It is from the same circumstance also that, as philosophers, we can obtain a scientific control over it—that we can procure it in its pure or abstract form, by our galvanic, electrical, and magnetic machines, and can transmit that which is imponderable, invisible, intangible, and immaterial, through wires.

In speaking of the transmission of force through wires, we are very apt to lose the proper conception of it as an immaterial thing, and to conceive it as sent through the wire as water or air is sent through a tube. This is not the way in which power can be transmitted. The world is bound together by power, as we have said. The force, then, which binds atom to atom in the wire is, when we are enabled to direct force through it, transferred or shifted along the line from atom to atom, each atom successively borrowing from its nearest neighbour on one side, and giving up to its neighbour on the other,—and so on, to the next, and the next, this immaterial principle passes along. It is supposed to be in this way that atomic power, disturbed at one end of a telegraphic wire, is with more than the speed of light transmitted through the wire, even though it cross the Atlantic or girdle the earth.

The decomposition of the animal tissues, and of organic compounds within the body, is the source of Animal Power. The subject of voluntary animal motion—whether the mental philosopher will, or whether he will not—is thus forced upon his attention; for physics and metaphysics here become indistinguishable.

So far as we have discovered, it is held by those who have prosecuted the subject, that animal power is derived exclusively from the decomposition of the muscular tissues. We cannot help thinking that this is a mistake. The organ which is under the immediate influence of the mind, in the voluntary movements of man and other vertebrate animals, is the brain; and we shall give our reasons for believing that the brain is the chief source of animal power.

We believe that animal power is obtained, either entirely or chiefly, by the decomposition of the

substance of the brain. Our grounds for this opinion are exceedingly simple and apparent.

The office of the blood, which is sent to every part of the body, is to remove the substance of the decomposed tissues, and to supply the materials for their recomposition and restoration.

Wherever we find an organ to be abundantly supplied with blood, we may safely infer not only that that organ is an important one, but also that its decomposition and restoration are proportionally rapid.

Now, one of the most striking circumstances connected with the brain of man, is the quantity of blood which is constantly being poured through it. Different estimates have been made; but, taking a medium view on a subject so difficult to determine, we may hold that one-eighth part of the entire blood of the body is directed through this important organ, whose weight is only about one-fortieth part of the body. According to this calculation, the brain gets five times the average supply of the other parts of the body, weight for weight.

We are, from this fact, justified in holding, that the amount and rapidity of decomposition which

goes on in that organ, must be very remarkable, and that the quantity of free force generated in it is proportionally great.

We have also to note this specialty, that the brain is peculiarly subject to decomposition. After death, this most honoured portion of the body is the first which falls into disorganization.

From these circumstances, then, we are led to regard the brain as the chief source of animal power. And we regard the mind, not only as the principle which directs the free force through the appropriate motor nerves of the body, but as the agent through whose mysterious action power is generated in the way we have stated.[1]

[1] We do not doubt that the muscular tissues also undergo rapid decomposition; for while the muscles, by their toughness and motor power, are eminently adapted to stand the tear and wear which is thrown upon them, they must yet from their continual working be as constantly requiring the operation of the restorative process.

The nerves, on our theory, only transmit that force to the muscles which calls them into action; but they are themselves far too tender to perform any direct work. This is done entirely by the muscular movements; but that it is the muscles that *generate* the force, we cannot help strongly doubting. If one who professes no acquaintance with the secrets of chemical science may be allowed an opinion, it is, as we have already said, that muscular force is generated in the brain, and we found this opinion on the reasons which we have stated.

That the parallel direction of the muscular fibres may serve to

We are in the habit of believing, without any inquiry, that the mind moves the limbs; and it is only when we come for the first time to consider the probable means by which so wonderful a phenomenon is accomplished, that a hesitation is experienced by the believer in matter. But when we are enabled to take a more comprehensive view of the world as a complete system—not mind and matter—but power, organized to fulfil the purposes of physical existence, we view the whole in a much clearer and more satisfactory light, and with an undoubting and unembarrassed spirit.

Where do we ever observe any want of efficacy in any of the established links of Nature's chain? Though all are equally mysterious, are not all

intensify the operation of cerebral force probably on the principle that the coil intensifies action in the electro-maguetic machine, we also consider very probable; but this we suggest in our ignorance of the subtleties of electric action.

If animal power comes from the brain, may this, we ask, not help to settle the question, so warmly contested, whether the oils and fats taken as food contribute toward sustaining animal force? The brain, besides albumen, contains various oleaginous products, and it occurs to us that this may account for fatty foods directly helping animal force, as has been asserted by some chemists, and not easily set aside by those who plead for nitrogen and flesh formers as the only source of strength. May not a considerable portion of the fats taken as food go directly to support the substance of the brain?

equally effectual for bringing about the ends designed?

The mind is the most largely endowed of all the works of God, and by far the most various in its powers. No doubt it is not conscious of, and does not attend to, the inner organic workings to which it is so close. It is quite possible the mind may have no ability to attend to these; but this is in analogy with what we know of its habits and faculties. In almost every instance the mind looks to the end, and not to the means. When an accomplished musician is performing a piece of music, he thinks not of his fingers, which are eliciting the notes from the violin—we may almost say he is unconscious of their movements—his mind is entirely occupied with the musical theme, and his whole efforts are engaged in giving expression to the sentiments and harmony of the piece. And so it is with the mind in the case we are considering. As a consummate artist it embodies fully the object it has in view; but it remains quite unobservant of the steps by which it is working out the desired effect. This circumstance, however, in no way disproves the fact

that it is the real agent throughout the whole performance.

We may hesitate as to the precise nature of the operation effected by the mind, in the mental effort imperfectly expressed by the word volition. Thus, we may conceive, that the mind directly deals with the *force* which holds the substance of the brain in organic combination, and that it directs it through the motor nerves to the muscles, thereby causing their action; the force being finally expended on the outward work, which we may, for simplicity, suppose to be the raising of a heavy weight. On this assumption, the force of organic combination being by the mental effort discharged from the portion of the brain acted on, decomposition of that part would be the result.

We may, however, view the mental act in a somewhat different light, and suppose it exerted not directly on the organic force, but on the substance of the brain, and as thus directly dissociating its molecules, and setting free the force which held them in previous combination. We prefer, however, viewing the mental act in the former of these two aspects; but in either case the mind is

represented as exerting direct power, and as being conscious of so doing. What can we call that mental effort which we put forth and sustain during the accomplishment of any heavy bodily exertion, but an exercise of mental power? The whole soul is engaged in any difficult bodily evolution, and the whole body shows that it is so. Every emotion and action of the mind, whether moral, intellectual, or physical, is faithfully represented in the action of the bodily muscles. Observe the face of a man about to perform some difficult feat of physical power; the mind anticipates, the mind arranges, the mind executes the whole; and all the emotions of that inner principle are duly and fully reported in the facial muscles, which are thus the exponents of its secret and invisible workings. The smile dies quickly from the face, the lips are compressed, the forehead gathers an expression of anxious and determined preparation, and the blood for a moment retreats to the heart,—this pause, the mind allows before hazarding the sudden, extreme, and difficult display of its utmost powers.

In every light, then—whether metaphysical or

physical—in which we may choose to view the matter, we come to the same conclusion, which we may thus sum up:—The mind, besides the possession of moral and intellectual powers, is also endowed with the command of physical power; were it not so, it could not command or direct the body, with which it is connected. The mind is conscious of possessing, and of exerting physical power, as well as of possessing power of thought and will; and as it *directly* perceives its own powers, so it *indirectly* perceives external power, as that which, having the same essence, meets and opposes it.

To reconcile metaphysicians to this view, we have only again to remind them that we regard physical power, in the World, as the expression of the Supreme Will; and physical power in the Creature, as the expression of the creature's will, rendered effectual by the control which has been given him over the forces of his own body, and through them over the forces of external nature.

CHAPTER X.

HAMILTON'S MODIFIED VIEWS ON DIRECT PERCEPTION.—CONCLUDING REMARKS.

AFTER so much written by Sir W. Hamilton on the *direct perception* of an external world, it is time that we examine the ultimate and more careful exposition of his views, which fortunately, after the fervour of contest had subsided, he had time to record. They are contained in some of the last notes corrected by his hand, and appended to his edition of Reid's Works. If these views are expressed elsewhere, we have not come upon them. In note D* we discover the difficulties he evidently experienced in reconciling his theory of a direct perception with the facts he encountered; and we discover the much narrower meaning he is led to assign to the words which were blazoned very large in the text of his previous writings. No

doubt the stout controversialist still keeps to the words *intuition* and *direct perception;* but even in the restricted sense in which he now uses these words, it will be seen how greatly he still complicates and perplexes the subject.

"Sensitive perception, or perception simply," says he, "is that act of consciousness whereby we apprehend in our body,

"1*st*, *Certain special affections*, whereof, as an *animated* organism, it is contingently susceptible." (Note D*, p. 376.)

Here is a flood-gate of controversy thrown at once fearlessly open. Is the word animated, which he puts in italics, meant to imply that the body perceives its affections? Surely not, else Hamilton is to be ranked with the Materialist,—a position which the whole tenor of his previous writings disallows. He continues thus:—

"2*nd*, Those *general relations* of extension under which, as a *material* organism, it necessarily exists.

"Of these perceptions, the former, which is thus conversant about a *subject-object*, is *sensation proper;* the latter, which is thus conversant about an *object-object*, is perception proper." (P. 877.)

We inquire, Does he mean that these two perceptions are two distinct intuitions, or merely two different directions given to the attention? But to continue our quotations—

"All perception is a *sensitive* cognition: it therefore apprehends the existence of no object out of its organism, or not in immediate correlation to its organism." (P. 879.)

"Thus, a perception of the primary qualities does not, originally and in itself, reveal to us the existence and qualitative existence of aught beyond the organism apprehended by us, as extended, figured, divided," etc. (P. 881.)

"The primary qualities of things external to our organism, *i.e.*, their extension and solidity, we do not perceive, *i.e.*, *immediately know*. For these we only learn to *infer* from the affections, which we come to find that they determine in our organs, affections, which yielding us a perception of organic extension, we at length discover by observation and induction to imply a corresponding extension in the extra-organic agents." (P. 881.)

This seems to us, at last, the truth, honestly though not very simply expressed, namely—that

by the impeded voluntary movements of our body, we infer the existence of the world as extended and solid, or resisting. This is very different from an intuition or direct perception of the external object, and is therefore in striking contrast with his voluminous writings on *direct perception*. In Chap. VI. we quoted enough to show that in his Lectures (XXV. and XXIX), he maintained that, at the finger-points, the mind had a direct perception of the table, and that it is the object in "immediate contact or relation with the organ that is perceived." He now makes our perception of the table an inference of the judgment, and not an intuition of sense. He continues thus:—

"The existence of an extra-organic world is apprehended not in perception of the primary qualities, but in a perception of the *quasi*-primary phases of the *secundo*-primary—that is, in the consciousness that our locomotive energy is restricted, and not resisted by aught in the organism itself; for, in the consciousness of being thus resisted is involved, as a correlative, the *consciousness* of a resisting something external to our organism. Both are, therefore, conjunctly apprehended." (P. 882.)

We only inquire, with reference to this passage, should the word consciousness, which we have marked in italics, not have been the word *inference*, to be in harmony with the previous passage quoted? The question he is considering, is regarding the precise nature of the faculty of perception, and precision is therefore all important.

Let us now discover, if possible, Hamilton's explanation of the distinction between sensation and perception, regarding which we have observed a great deal of rather vague writing throughout his works,—as if the subject were all important, but as if it were at the same time so obdurate and inexplicable, as not to be reducible to simple language.

"The organism (p. 880) is the field of apprehension both to Sensation proper and Perception proper; but with this difference, that the former views it as of the Ego, the latter as of the non-Ego —that the one draws it within, the other shuts it out from the sphere of self. As animated, as the subject of affections of which I am conscious the organism belongs to me; and of those affections which I recognise as mine, *sensation proper* is the

apprehension. As material, as the subject of external figure, divisibility, and so forth, the organism does not belong to me, the conscious unit: and of these properties which I do not recognise as mine, *perception proper* is the apprehension."

This seems to us culpably vague. Does Hamilton mean that the body feels, or does he remain steady to the principle that the mind alone feels? or do they possess a power of feeling conjunctly, though not separately? If the body is sensitive in strict philosophical language, it possesses, so far, the attribute of mind. If sensation and perception are, as seems to be inferred in this *note*, two different perceptions, or cognitions, or intuitions, the one is made, by the above explanation, to be an intuition of bodily affections existing in my body as a sensitive part of me—*i. e.*, of my soul—and the second intuition regards the affections as no part *of me*, but as movements or disturbances in the flesh, bones, or nerves of my body. Surely, as we have remarked, it is better to stand steady to the doctrine, that the mind alone perceives sensations, or is affected by the nervous vibrations transmitted to the brain; the statement

regarding the nature of sensitive perception would then stand thus:—That sensations are entirely in the mind; but that when we direct our attention to the affection as caused by a physical action existing in the body, we assign it a physical cause, and call it a *bodily affection;* and that when we yield to the practical bias of our nature, and fix the attention on the extra organic cause, we call this same bodily affection a perception of the external object or cause; which last is, however, not a direct, but a mediate perception—or, in more correct language, a judgment or inference of reason passed on the phenomena, mental and physical, voluntary or involuntary, of which we are simultaneously conscious.

Without doubt, the question of real importance is this simple one: What is presented to the mind, and what does it perceive? Now, here we think there can be only one answer, namely this: A vibration is transmitted to the brain along the nerves, and the mind is conscious, not of this particular movement, but of a sensation or mental affection. The mind takes the sensation up, and assigns an external physical cause for it. Cause

thus, by the law of our nature, becomes synonymous with the outer object, which comes thus chiefly to occupy the attention in ordinary cases. This directing of the attention to the external cause we, in common language, call perception; while, correctly, perception is the consciousness of the mental affection.

That all sensations appear to exist in the body, or more correctly in the extremity of the nerves of sensation, and sometimes, as in vision, in points external to the nervous extremities affected, is undoubted. This is a striking peculiarity in the character of our sensations. From our inability to account for it, it is usually assigned to a physiological cause; the object and importance of the law in animal life is, however, very apparent. Even years after a leg has been amputated, as previously observed, sensations are experienced which, though in the mind, are referred to the foot or the toes of the lost limb. This should have made Hamilton hesitate in founding his theory of direct perception, on the hypothesis of the mind pervading the body, and perceiving the bodily affection where it existed. In vision, we refer the sensations not

to the points of the retina affected, but to points external, and at right angles to their position on the *retina*. Thus—from some law, original or acquired, but quite invariable—in the case of the amputated limb we falsify, and in the case of vision we invert, the position of the nervous affection; for the affection or impression is perceived or conceived by us as an external object in an *erect* position, though it stands inverted on the *retina*.

But let us see how much further into difficulties Hamilton's peculiar views lead him.

"It may appear not a paradox merely, but a contradiction, to say that the organism is at once within and without the mind—is at once subjective and objective—is at once Ego and non-Ego. But so it is, and so we must admit it to be, unless, as Materialists, we identify mind with matter. The organism *as animated—as sentient*—is necessarily ours; and its affections are only felt as affections of the indivisible Ego. In this respect, and *to this extent*, our organs are not external to ourselves." (Foot note, p. 880.)

Here is indeed, as the author admits, a very glaring paradox. The body is at one moment

made conscious of its states and affections—*ergo* is a self-conscious principle—and the next moment it is converted into mere flesh and blood and bones. This is, indeed, establishing the doctrine of direct perception, but it is doing so at a fearful sacrifice of consistency; for if the body perceives its own states, the point is no doubt carried, but only by abandoning our most cherished views, and declaring the body to possess those perceptions which are usually ascribed to the mind alone. We doubt, however, whether the meaning of the author is what the enigmatical language employed would lead us to conclude. He probably means no more than that the mind being, as he assumes, everywhere present throughout the body, it takes note of all the affections that occur in this domain; and that at one time it regards them as they affect itself, the conscious lord and owner; and, at another time, regards them as they affect the extended organism to which it has access.

If Hamilton, when studying the subject of perception, had been content to view the mind as successively in three different attitudes, he would have escaped the very awkward predicament into

which he allows himself to fall. Had he regarded the mind as at one moment in the act of attending to the quality of its sensations, *i.e.*, philosophizing; at another moment as in the act of considering these sensations as located in, or caused by, physical affections in the body; and then, thirdly, as disregarding altogether the sensations as such, and occupying itself with the external cause or object,—had he been content to take this simple view of perception, he would, we think, have exhausted the subject, and without the help of any paradox.

No one but a Materialist, in this country, holds that matter feels, and it is a pity that Hamilton should have given any countenance to a view which elsewhere he very earnestly rejects.

It seems now to be established, by the physiological experiments which we have alluded to in a previous chapter, that the mind does not feel in any of the outward organs, but in the brain. It has, moreover, long been known that sudden and sharp injuries inflicted by the knife of the experimenter, on the substance of the brain of the lower animals, can scarcely be said to be felt. It is

highly probable, therefore, that this central organ, which itself does not feel, excites sensations in the mind chiefly, if not only, when it is itself excited in a particular way through those nerves of sensation, which, with this special view, are made to converge to it from the different parts of the body. So curiously and wonderfully are we framed!

We admit that certain diseases in the brain frequently produce paroxysms of acute pain; but this is a peculiar case, and the effect is special and exceptional, and the object of the specialty is evident.

Feeling or sensation is thus, by the decisions of science as well as of reason, to be viewed as driven back from matter, from flesh, and from nerve, to its proper position in the mind, and let us rejoice that it is so.

Let us remember, however, that though all sensations are in the mind, yet our faculties are given us for practical, not for philosophical purposes. In perception, therefore, the child very soon becomes the man; probably long before he is ushered into the world he learns to objectify his sensations, assigning them a place either in his own minute

microcosm, or in the organic world in which he lives.

Certain sensations—such as physical pleasure and pain, the sense of heat and cold, of smell and taste, and other purely animal feelings—are given us that we may be induced to observe the conditions of animal life. These, by a wise law of our nature, we objectify, and feel as having their seat in the body. Other sensations, capable of being applied to more intellectual purposes—such as those of vision, hearing, and some of those connected with touch—carry the mind at once outward; and we attach the sensation to the object exciting it, and these are, fortunately, the most constantly present to the mind.

And thus it is that, by a law of our mental constitution, we live not within ourselves, not in our thoughts and sensations merely, but amidst the thousand external interests of Nature. Each object solicits attention by a distinctive appeal; and the mind instantly not only recognises the appeal, but clothes the outer object with the quality of its own sensations. The grass it thus makes green, the sky blue, the mountains gray, the sugar sweet, the

fire hot. The murmur of the river it makes drowsy, the blare of the trumpet bold and defiant, and all nature it largely stamps with mental sensations, and not with material qualities. This is the poetry of our nature, and it is given by the hand which formed us.

But this by itself, however beautiful we must regard the provision to be, is not sufficient to account for all the charms we find in Nature; and we may well inquire, If all we obtain by the senses, are certain sensations more or less pleasing or more or less disagreeable?—if all we perceive, is that external objects are hard and unyielding or soft and pliable, and that they have certain colours and smells; that some substances are sweet and others bitter; that some give us strength and others deprive us of it? If this most meagre knowledge is all we gather from physical objects, what is it that gives the world its hold of us, and makes it a field of never-ending interest? It is the mind still which has this power. It is the living, ever-active principle given us by God which transmutes the dust of the world into gold. It takes up the dry lifeless materials of sense, and, bringing them into

alliance with its own incomprehensible spiritual nature, endows even inanimate things with its own life and feeling, and converts arbitrary signs and symbols into the living language of thought. The mere symbols it esteems of little moment in themselves; it uses them but as helps to deal with higher truths. It speculates on causes; it discovers laws; it is warmed with affections; it is charmed with the beautiful; it is elevated with hope; it lives in human sympathies.

How much of life is dependant not on self, or on the impressions of sense, but on the lives of other beings, who are counterparts, more or less close, of ourselves! How much is our knowledge — our moral nature — our daily occupation — and the value we ascribe to things, influenced and directed by the souls of other men! They add it may be, not a letter to the alphabet of sense, but how immensely do they add to the range of our thoughts, and to the sum of our enjoyments! It is in the world of living men that the mind finds the largest exercise for all its faculties. For, while in inanimate objects we everywhere discover order, beauty, and power, it is in the region

of life that we discover the world to possess its great moral meaning, and to abound in interests of substantial and enduring value.

Man possesses no more perceptive senses than the irrational animals; but by the exercise of Reason, he turns the materials with which he is supplied to much better account, and to much more various uses than they do: and he is led also, by this higher faculty of his mind, to many conclusions which they cannot apprehend. One of the most singular of these is the conclusion which leads him to believe in an unseen cause, and to put trust in a Being he has never seen.

The mind of man is, by this principle of faith, evidently formed to rise above the earth and the objects of time and space;—it views things not merely as they are,—it sees many things which are not revealed to it by the senses,—it receives, and more or less shapes and colours, everything according to the law of its own spiritual nature. Thus it is, that even amidst the mingled turmoil of the world, and the solicitations of sense, man looks ever instinctively upward to the things which are unseen: and reverently,

and more or less trustingly, he ever addresses himself to the great Paternal Being whom no finite being has seen—whom no finite mind is able adequately to comprehend.

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